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Number 3.

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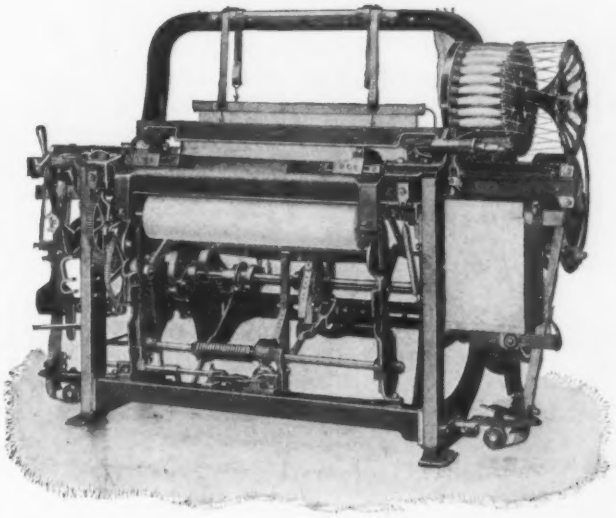

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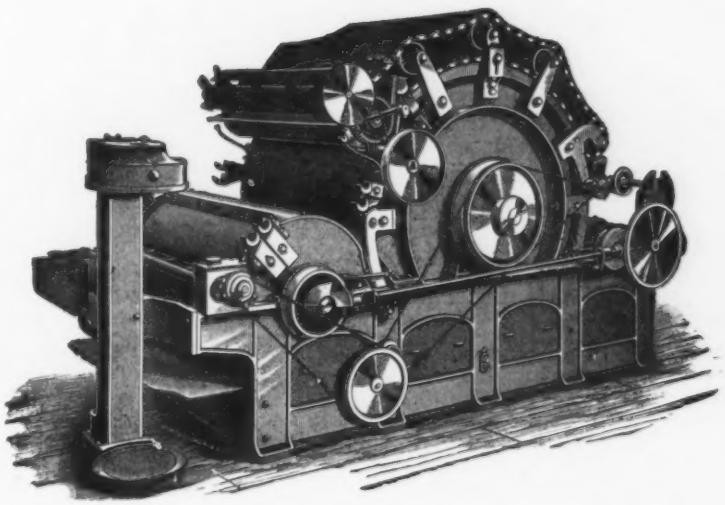

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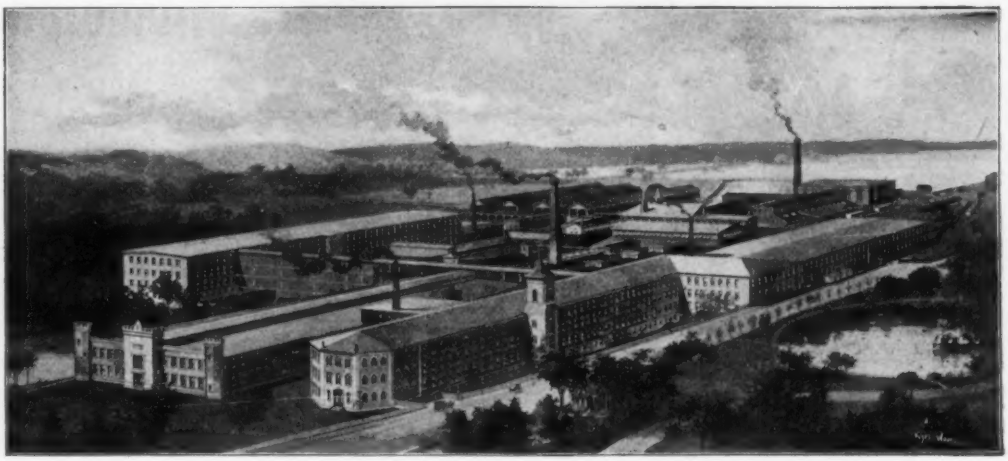

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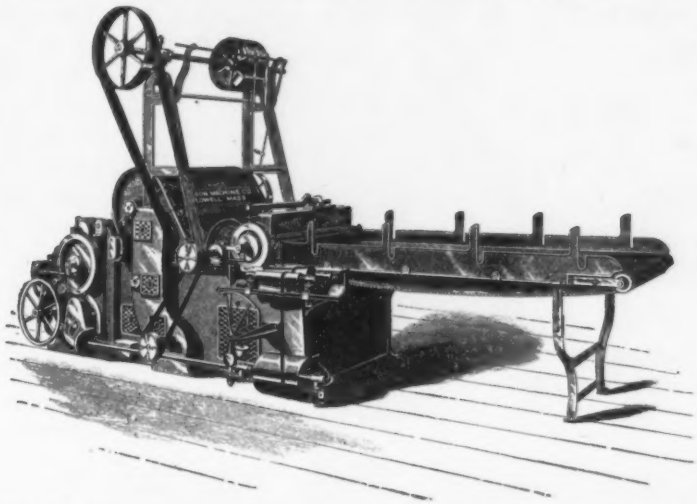

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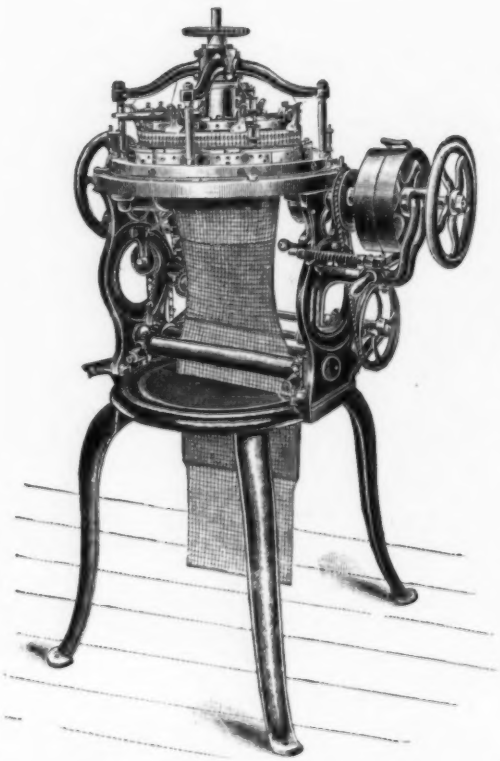

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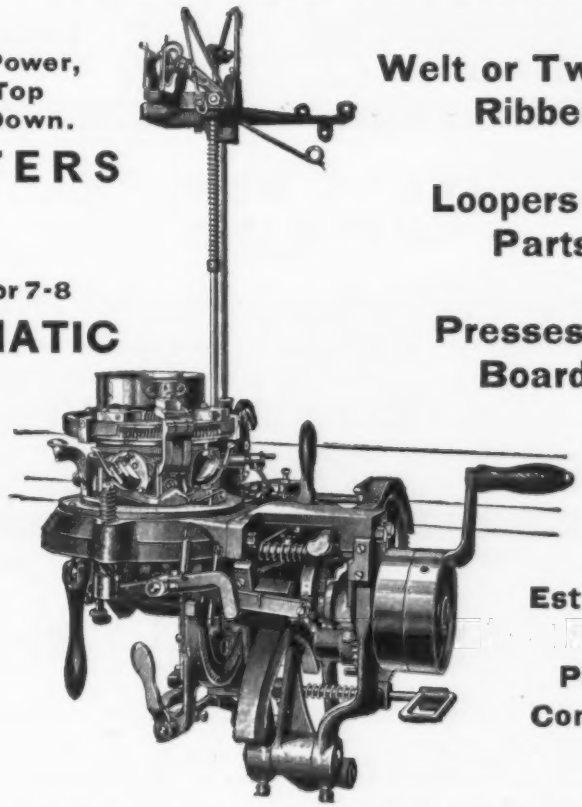

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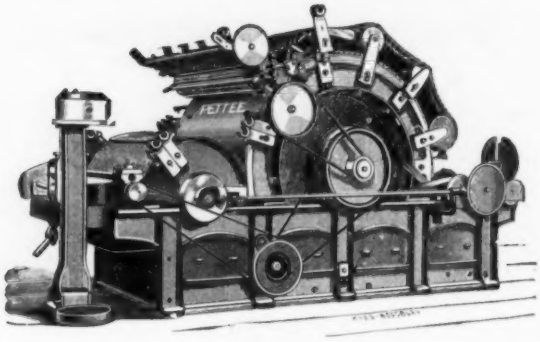

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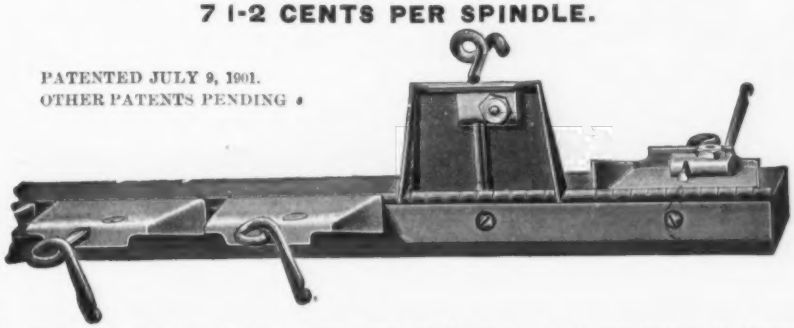

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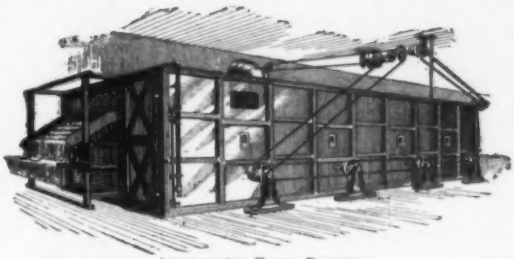

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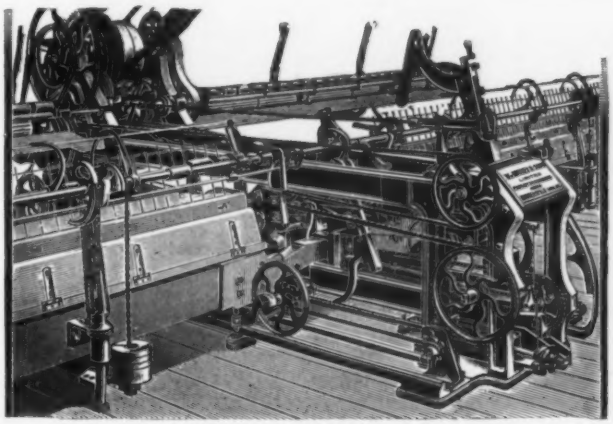

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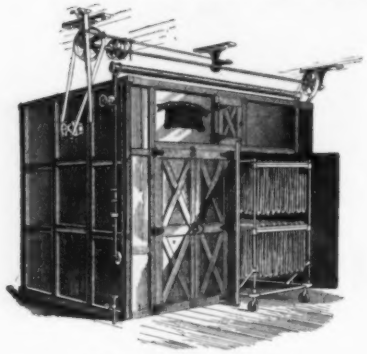

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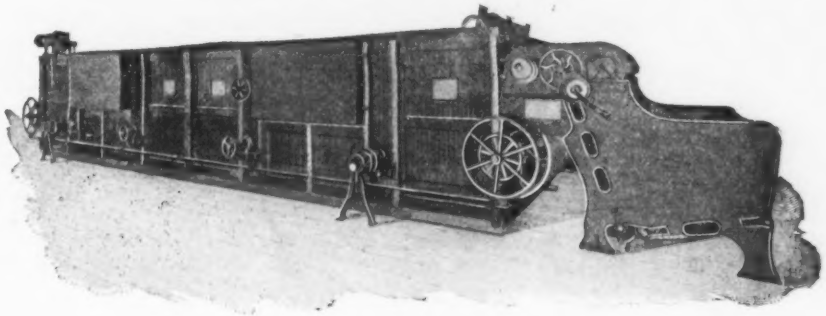

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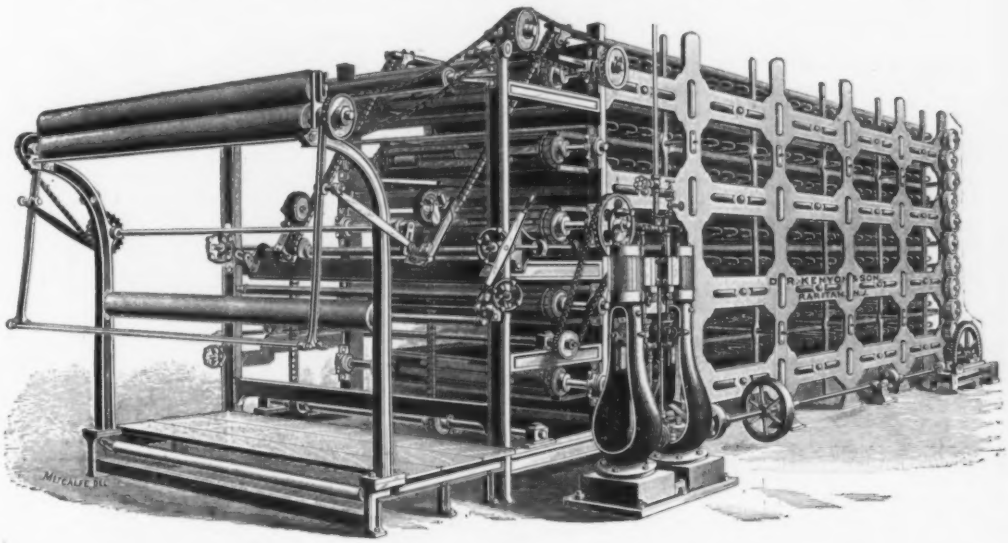

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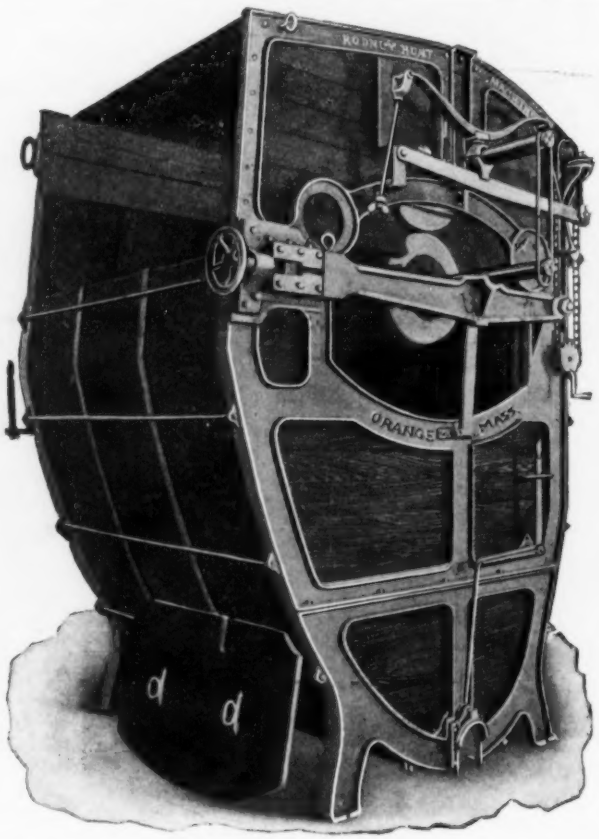

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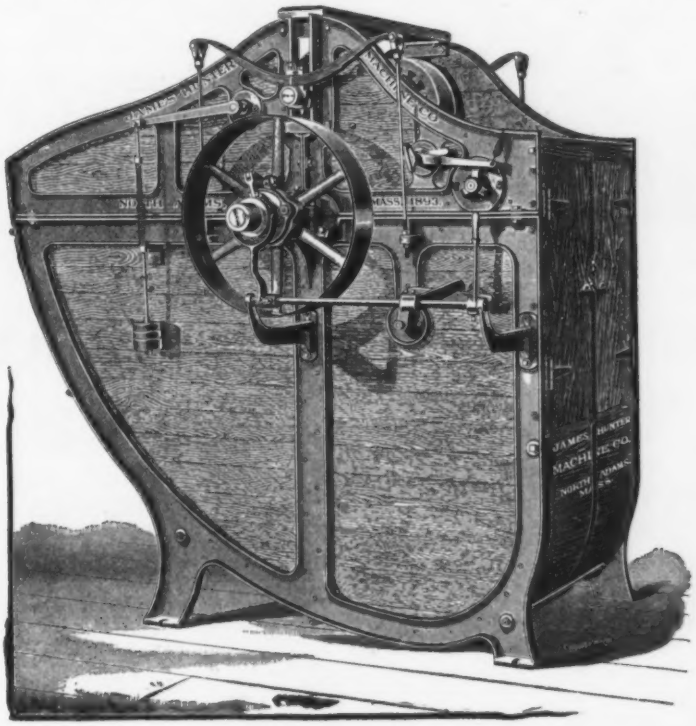

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You Want the Best. We Build Them.

CLOTH WASHERS, FULLING MILLS,

1901 FULLING MILL.

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

HOPKINS MACHINE WORKS

Providence and Bridgeton, R. I.

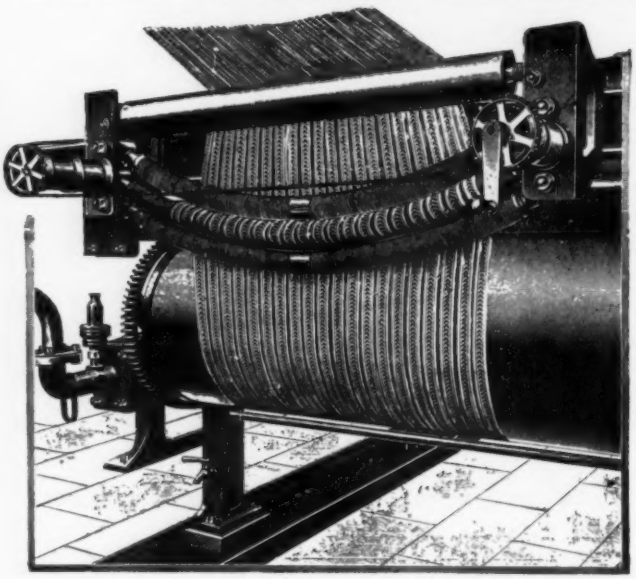
PROVIDENCE OFFICE

49 Westminster Street.

Our Machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our Fulling Mill for extra heavy goods and blankets.

A PERFECT CLOTH EXPANDER



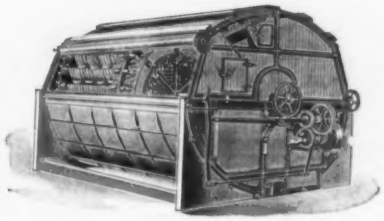
The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

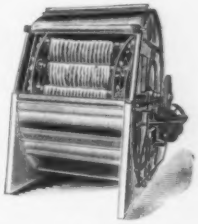
Sole Agents for the United States and Canada.

SKEIN AND SLUBBING MACHINES.



SAVES
75 per cent in Labor,
30 per cent in Winding,
Steam and Dye Stuffs,
Perfectly Even Dyeing.

CAPACITY:
50 to 700 pounds per batch.



No Friction on the Skeins. No Tangling of the Yarn.

Universally Used.

J. H. A. KLAUDER, Pres. and Gen'l Manager. J. H. GILES, Treasurer.
E. HEPPENSTALL, Huddersfield, Eng.

THE KLAUDER-WELDON
DYEING MACHINE CO.,
AMSTERDAM, N. Y.

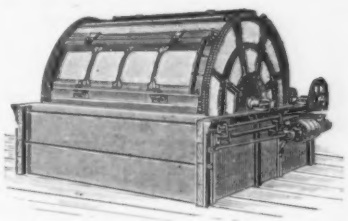
BUILDERS OF MACHINERY FOR DYEING, BLEACHING AND MERCERIZING.

For Skein — Worsted, Slubbing, Cotton and Silk.
" Raw Stock — Cotton, Wool, Waste and Slubbing.
" Garments — Underwear, Hosiery, Hats and Caps.
" Sulphur Colors — Skein, Raw Stock and Hosiery.
" Skein and Warp Mercerizing.

RAW WOOL AND COTTON MACHINES.

SAVES
50 per cent in Labor,
besides Steam and Dye Stuffs.
Practically Indestructible.

CAPACITY:
200 to 1000 lbs. per batch.



Leaves Stock in Perfect Condition. Does Not Mat or Tangle the Fibre.

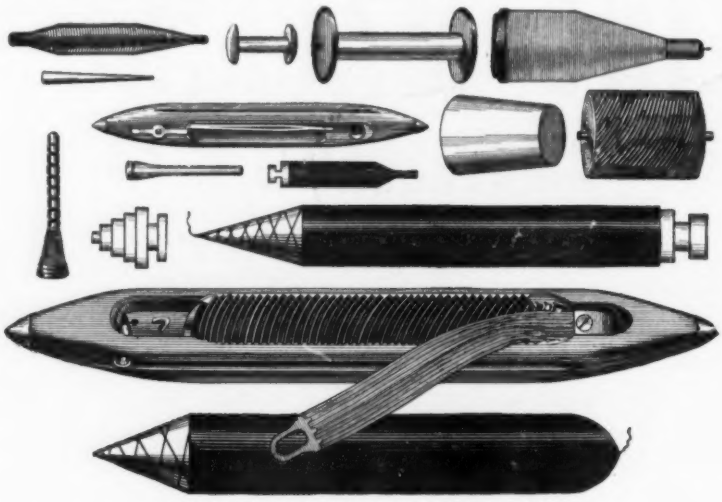
A Perfect Machine.

OSWALD LEVER

Formerly LEVER & GRUNDY

Builders of Textile Machinery

FILLING COP WINDING MACHINES. Spindles driven by belts or by gears, and bobbins can be made to wind any kind of filling from the coarsest to fine numbers, from Skeins, Spools, Cones, Mule Cops, or any other Spinning or Twister Bobbins. These machines will put more yarn in a given size of shuttle than any other machine in use.



OUR MACHINERY PUTS YARN IN CONDITION FOR MANUFACTURING AS SHOWN ABOVE.

BANDLESS SPINDLE SPOOLING MACHINES; adapted to the finer grades of yarn and to the finest silk. ***PRESSER DRUM SPOOLING MACHINES;*** arranged to spool in any way the trade requires. ***BANDLESS VARIABLE SPEED MACHINES;*** to wind the large bobbins used in knitting mills; these machines can be arranged to wind cops or butts from the largest used in any weaving to the smallest cops or butts for cotton filling used in the silk trade. ***CONICAL AND STRAIGHT TUBE WINDING MACHINES, BRASS BOBBIN WINDING*** and other machinery for lace mills. Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, Reeling Machines to prevent waste at the bottom of mule bobbins.

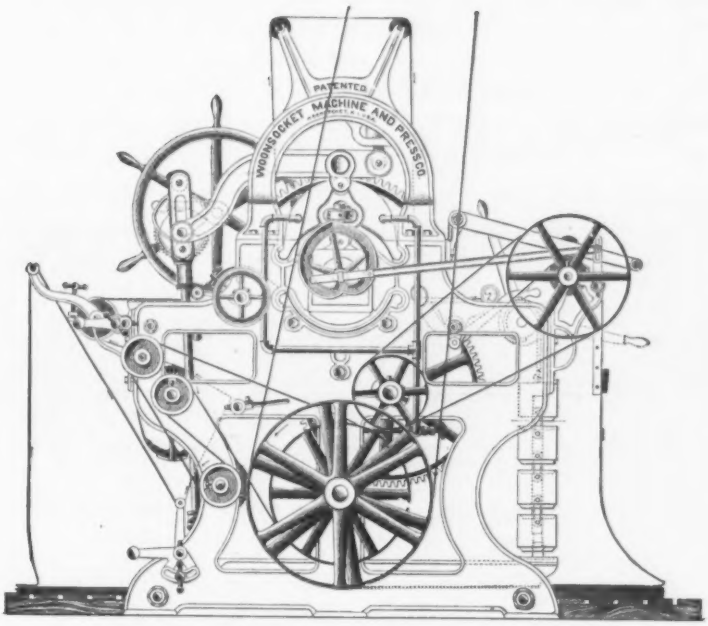
Lehigh Ave. & Mascher St., Phila., Pa.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

Woonsocket Machine and Press Company

WOONSOCKET, R. I,

WILLIAM FIRTH, Pres. *The* FRANK B. COMINS, Treas.

AMERICAN MOISTENING COMPANY

Received the **HIGHEST AWARD** on recomendation of the FRANKLIN INSTITUTE for

"Simplicity and Originality of Design."

Is the largest manufacturer of **HUMIDIFIERS** in the World. The last twenty years receiving the **HIGHEST AWARDS** in this country and Europe for its **Air-Moistening System. Eight Gold Medals** and others as follows:

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Atlanta 1895,	New York 1887,	Berlin, 1883.

The Only Perfect System of Air-Moistening

And Has Been Adopted by the Representative Manufacturers of this Country

THE ONLY SYSTEM ADOPTED IN THE TEXTILE SCHOOLS

COSTS LESS TO OPERATE

than any other system on the market. Has given satisfaction where other devices have failed.

EQUITABLE BUILDING, BOSTON, MASS.

WRITE FOR BOOKLET "T" ON HUMIDIFICATION.

Legal Proceedings will at once be taken against infringers and users of infringements.

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WILLIAM FIRTH CO.

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ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

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LOCKETT, CROSSLAND & CO., Engravers and Builders of Leather Embossing Machinery, etc., etc.
R. CENTNER FILS, Heddles.
GOODBRAND & CO., Yarn Testing Machinery, Wrap Reels, etc.
JOSHUA KERSHAW & SON, Roller Skins, etc.
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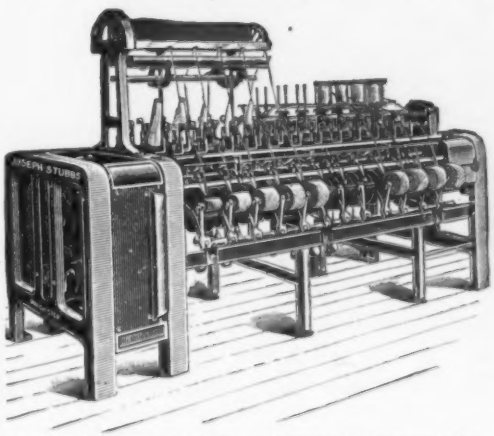
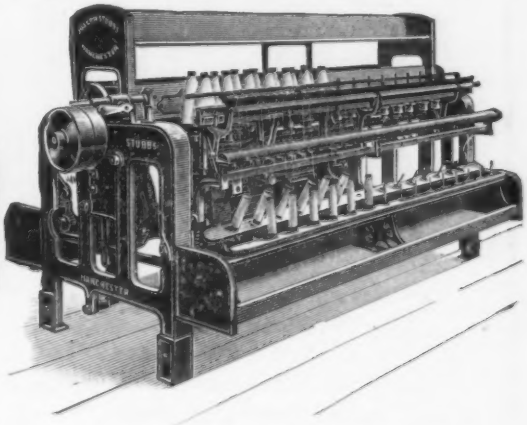
JOSEPH STUBBS, . . Manchester, England,

SPECIAL MACHINERY,

For Winding Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

Sole Agents for the United States and Canada:

WILLIAM FIRTH COMPANY, 67 Equitable Buildings, 150 Devonshire Street, BOSTON, MASS.

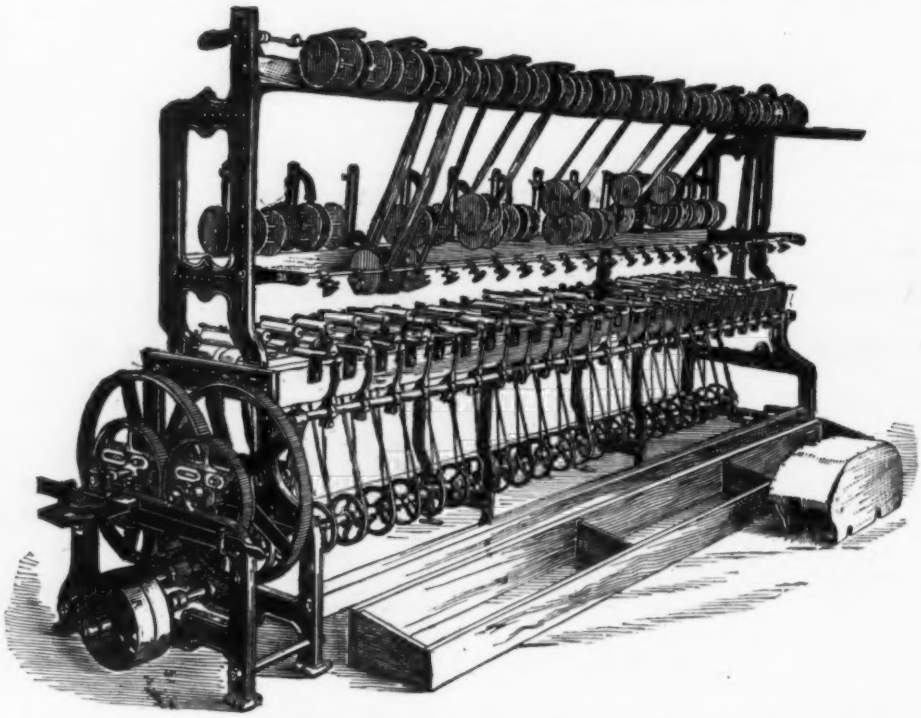
Pulley and Gear Forcer.

We build a simple, powerful and very effective machine to remove gears and pulleys from shafting. Many mills use them. **Only costs $8.00.** Saves its cost in time and breakage.

BAMFORD & SMITH, Pascoag, R. I.

Patent Skein Winder

FOR SHUTTLE BOBBINS, WITH VARIABLE MOTION



YOU HAVE THE SKEIN YARN; HERE IS AN UP-TO-DATE SKEIN WINDER TO HANDLE SAME TO BEST ADVANTAGE. LET'S GET TOGETHER!

This winder is especially adapted for Mercerized Yarn or the finest counts of Cotton, Woolen or Worsted Yarns. High speed; rapid production; best quality of work. Guaranteed to make hard, smooth bobbins, which will produce SMOOTH cloth. Also Build a Line of

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FULL PARTICULARS ON APPLICATION.

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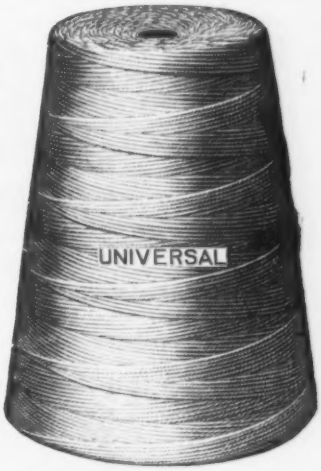
THE BEST SYSTEM IN THE WORLD FOR WINDING FIBRE AND WIRE.

NO KINKING.
NO WASTE.
NO VARIATION IN TENSION WHILE UNWINDING.
NO REWINDING REQUIRED.



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The Best Winding Machine in the World.

High Speed, Great Durability, Interchangeable Parts, Perfect Tension, Easy to Operate.

UNIVERSAL WINDING COMPANY

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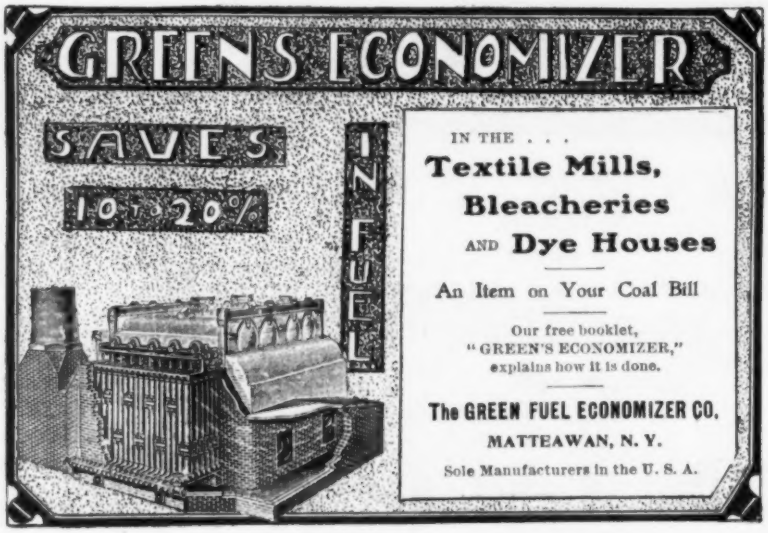

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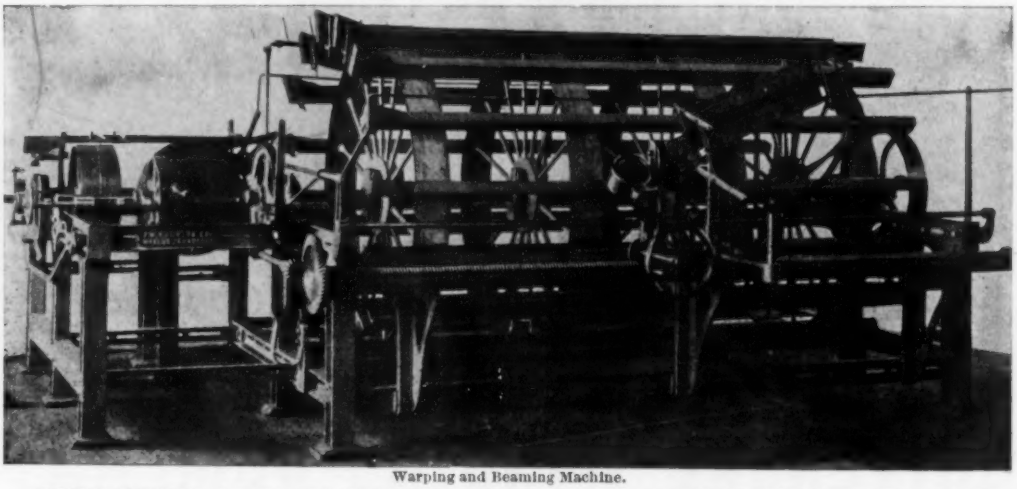
Established 1864. IRON AND BRASS FOUNDERS, GENERAL MACHINE MAKERS AND MILLWRIGHTS,

Telephone, No. 2132 Bradford. Telegrams, "Machines, Bradford." W. U. T. Code used.



Warping and Beaming Machine.

SPECIALTIES: Dyeing and Finishing Machinery. Tentering and Drying Machines. Wet Finishing Machines. Mangles. Calenders. Warp and Hank Dyeing Machines. Hank, Warp and Piece Mercerizing and Lustring Machinery. Yarn Finishing Machinery. Patent Sectional Warping and Beaming Machine.

Estimates and Plans prepared for complete Piece or Warp Bleaching, Dyeing and Finishing Works.

Fabric Measuring & Packaging Co.

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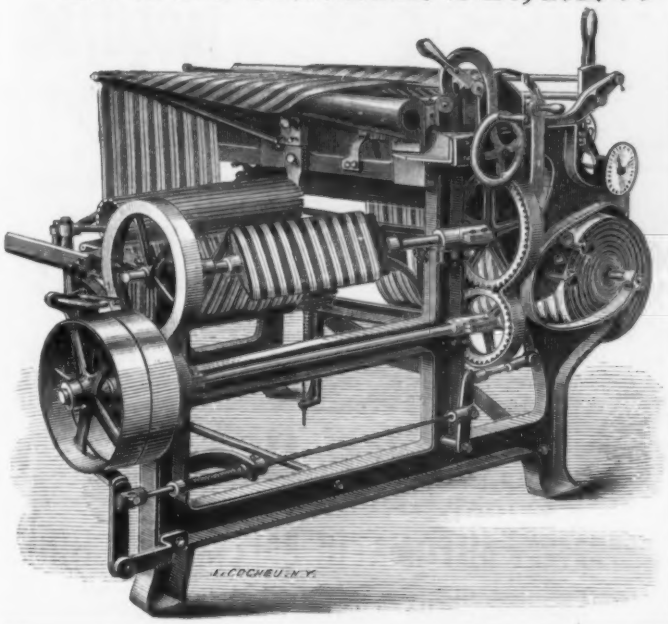


Machines to Print Trademarks

On Cottons, Woolens and Carpets.

Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

HAVE YOU SEEN BOYD'S Patent Worsted Spinning Frames?

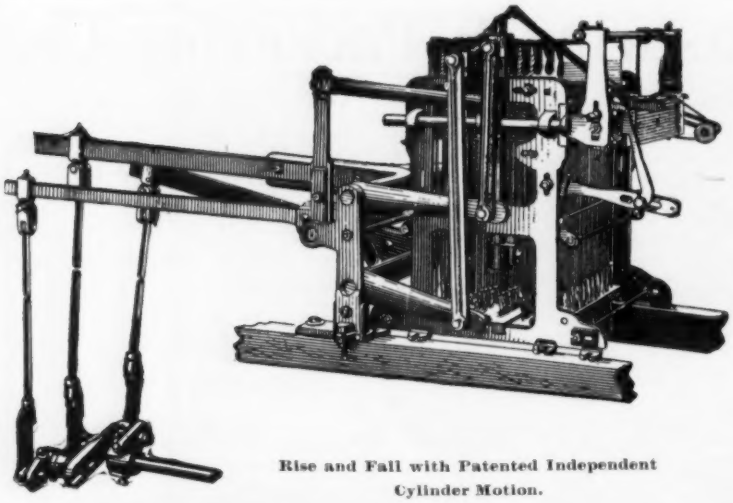
They Spin Better and Take Much Less Power to Drive than any of the other Spinning Frames in use

BOYD'S Patent Stop Motion Twisters
Patent Stop Motion Winders

FOR ALL KINDS OF FIBRES

Made by **J. & T. BOYD, Ltd.,** GLASGOW, SCOTLAND.

Sole Representatives for the United States,
SPEED & STEPHENSON, 170 Summer St., BOSTON, MASS.
Correspondence respectfully solicited.



Rise and Fall with Patented Independent Cylinder Motion.

USE THE

HALTON JACQUARD

"The Best Machine on the Market"

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

THOMAS HALTON'S SONS,

Allegheny Avenue and C Streets,

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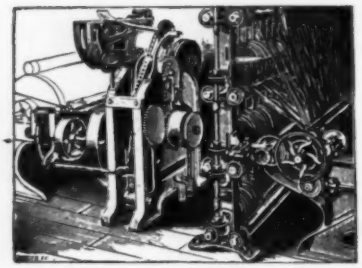

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HARRISON, N. J.

TORRANCE PATENT **AUTOMATIC BALLING MACHINE**

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

Builders of CHOQUETTE WASTE SAVING and CLEANING DEVICE.

Write for particulars.

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MANUFACTURERS OF

Wool Burring, Picking and Mixing Machinery

Cloth Finishing Machinery

For Cotton, Woolen, Worsted, Plush Goods, Etc. Shearing Machines a Specialty.

New Works, 56 Cambridge St., near Webster Sq.
Send for Descriptive Catalogue.

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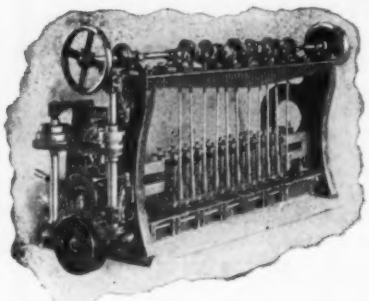

Standard Horse Blanket Machine.

L. F. FALES,

Manufacturer and Builder of

Multiple Needle Sewing Machines,

For Sewing Carpet Lining, Horse Blankets, Wadding, etc.

These machines can be built with any required number of needles.

SPECIAL MACHINERY DESIGNED AND BUILT.

Telephone Connection.

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Estimates Cheerfully Given.

SHEARS for finishing Cotton, Wool or Worsted Fabrics made in single sets or in several sets to finish face and back at one feed, saving space, time, cost. The Combined Shear and Roller for Carpets is an example. Baling and Finishing Presses for Straw, Felt and Buckram Hats. Shafting, Gearing. We grind or repair all makes of Shears. HOWARD FOUNDRY & MACH. W'K S, Landsdowne, Delaware Co., Pa.

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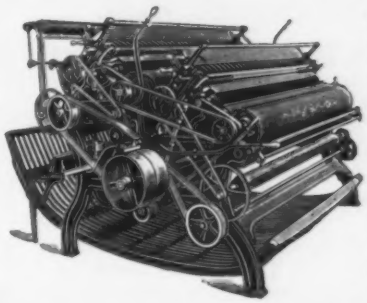

The Finest Shearing Machine in the World. Get into line. Use Double Shears. We will take your Single Shears in trade. Our representative can interest you. He will call at a word from you.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

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The Metallic Drawing Roll Co.

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Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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Sew any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

Send for new circular telling how to get perfect work in this department.

BLEACHING, DYEING and FINISHING MACHINERY.

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SOMERVILLE, OR ARLINGTON HEIGHTS, MASS.

R. H. HOOD,

Successor to THOMAS RAMSDEN,

Maker of

Worsted Machinery,

For Preparing, Finishing Gills and Drawing Boxes

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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And All Kinds of Expansion Combs, for Warpers, Beamers, and Slashers.

ALSO TRAVERSE WHEEL AND ROLL GRINDERS for American or English Cotton, Woolen or Worsted Cards.

Particular attention given to the Repairing of Grinders of all makes for Cotton Woolen or Worsted Cards.

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Cloth Stretchers

Thread and Yarn Reels
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Yarn Printing Machines for Warp or Skein, Belt Cutters, Scarfing Machines.

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IMPROVED SPINNING AND TWISTING MACHINERY

FOR HARD OR SOFT TWINES, LINES, CORDAGE, ETC.

Of Sisal, Manila, Cotton, Linen, Hemp, Jute, Silk, Hair, Paper, or Wire.

Write for particulars in regard to our new machine for spinning heavy Cotton Yarn direct from Drawing Sliver for Cotton Rope, etc.

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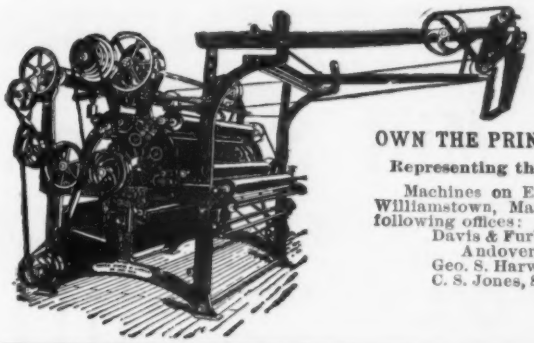

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OWN THE PRINCIPAL PATENTS ON NAPPING MACHINES.

Representing the latest French, English and American Patents.

Machines on Exhibition and Samples Napped at North Andover and Williamstown, Mass., or Philadelphia, Pa., on application to any of the following offices:

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Established 1870

John Heathcote & Son

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Builders of Improved

Cloth Tentering and Drying Machinery

for WOOLENS, WORSTEDS, FELTS, etc.

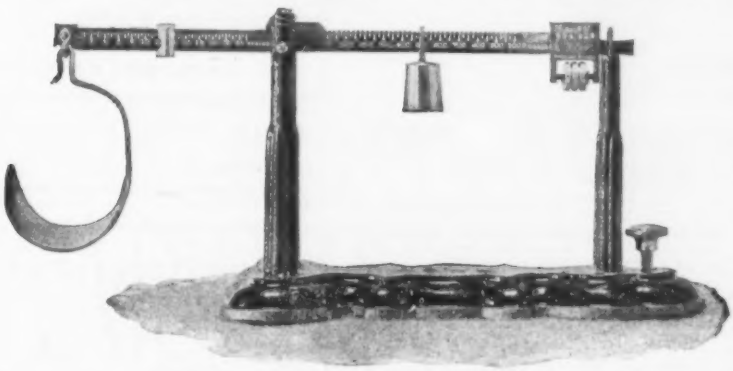
Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

Send for Catalogue

A ROVING or YARN SCALE

That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



WITH THE WEIGHTS ALL ON THE BEAM. **NO LOST WEIGHTS WITH THIS SCALE.**

One of the most sensitive scales made. Positive and accurate. Send for prices.

SWEET & DOYLE,

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KNITTING MILL SUPPLIES.

☞We make scales of every description.

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Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.,
PROVIDENCE, R. I.

in Mill Supplies.

E. L. TEBBETS & CO.,
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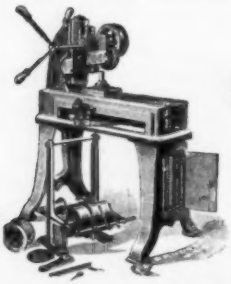
Thread and Silk **SPOOLS** **of any description.**

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.



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Gear Cutting Machine

Especially adapted for use in Repair Shops. Now in use in **Three Hundred** representative mills, including **Twenty-Four** in Fall River, Mass. On application, we shall be glad to submit full particulars, prices and photographs of the latest improvements. Send for **Gear Cutter Pamphlet.**

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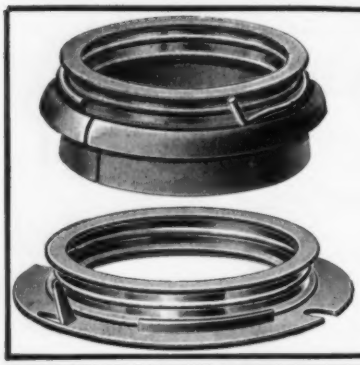

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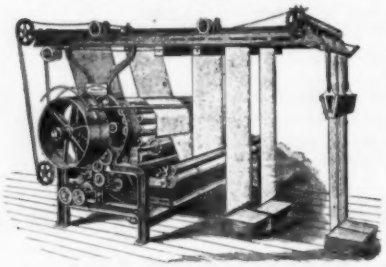

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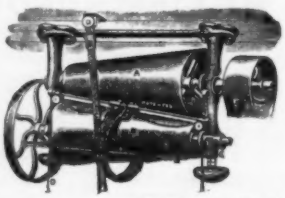

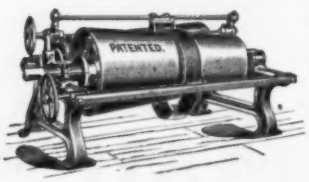

Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 375 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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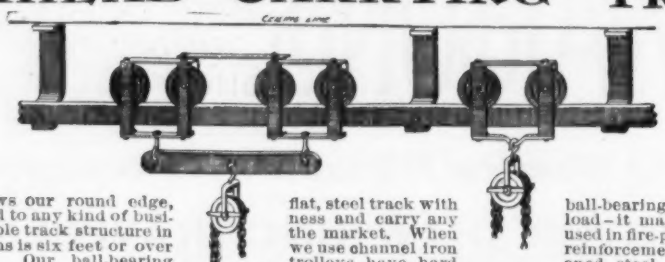

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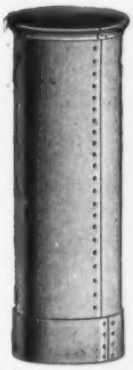

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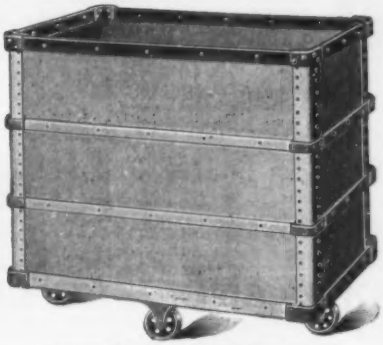

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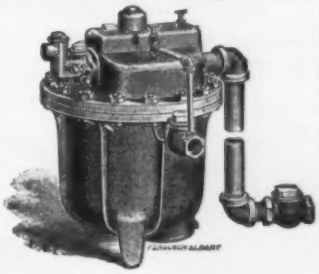

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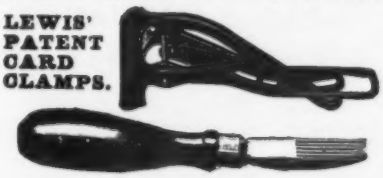

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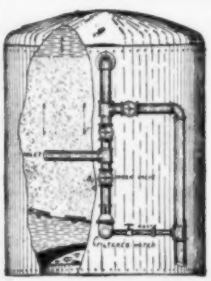

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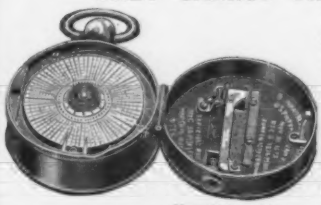

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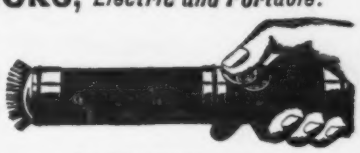

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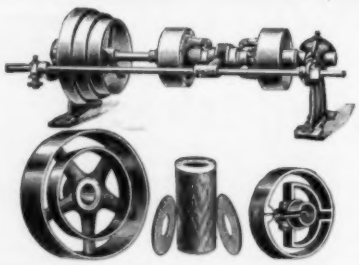

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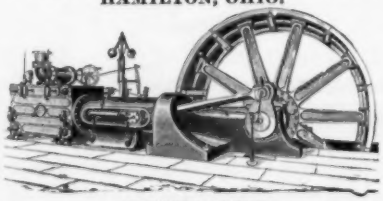

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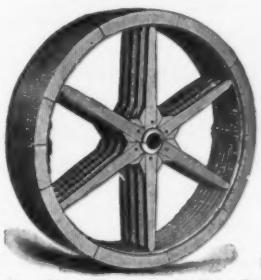

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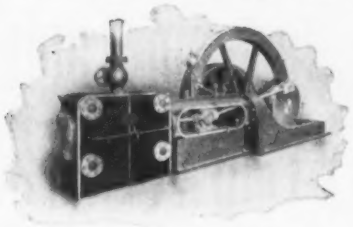

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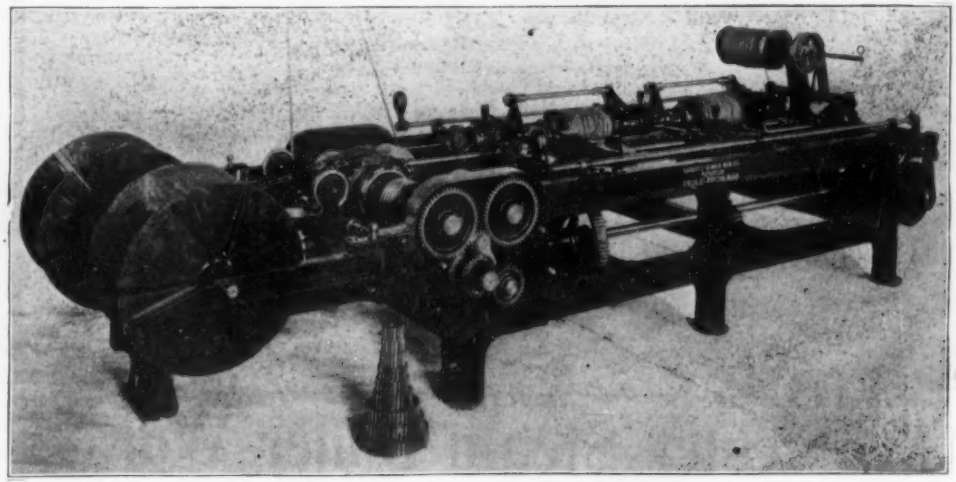

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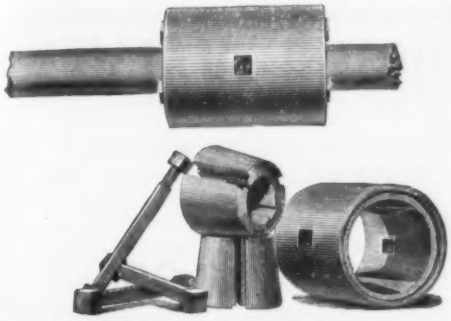

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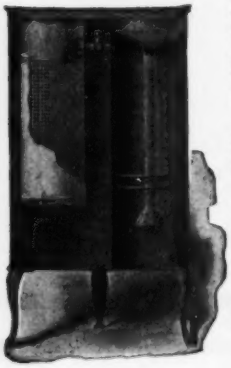

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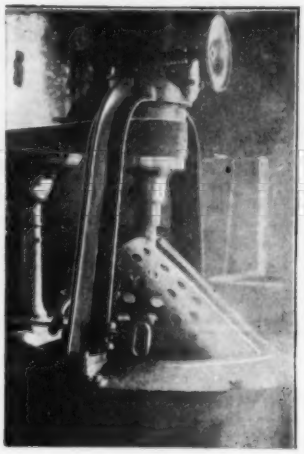

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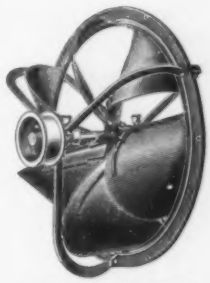

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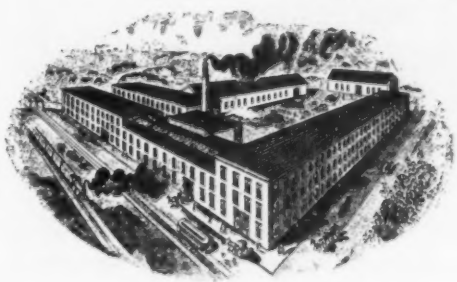

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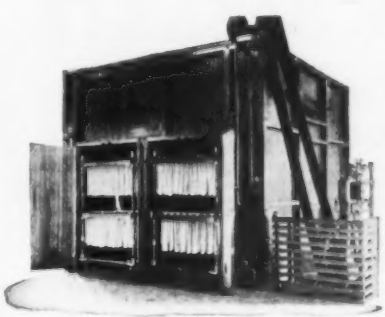

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DYE STICKS, Kettle Sticks and dry and sulphur house Poles, also Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon and Lorimer machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

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Embodies desirable features not found in any other basket. It is made of strong, smooth, cotton duck, doubled at all points of extra wear or strain.

The Frame is made of specially drawn round spring steel, put together with our semi-flexible eye joints, making it strong and sufficiently rigid, yet springy and resilient, and will stand the most severe use.

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Is one of the many excellent features of The Morris Duck Basket. If you want a basket to wear well, try it.

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Mfrs. Groveville Mills Cotton Duck,

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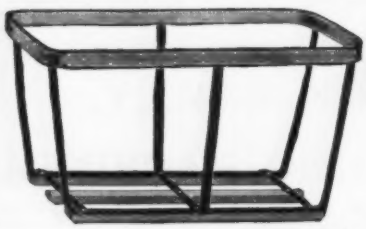

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WITH A FRAME OF

FLAT TEMPERED SPRING STEEL and a RIM of

ROCK ELM

securely riveted at every joint and point of intersection *must be* ABSOLUTELY RIGID, for you cannot bend a flat piece of steel edgewise. Wooden shoes protect the bottom. Handles cut under the rim or made of canvas as preferred. Smooth inside and easy to handle. The IDEAL basket. No other so strong. "BALLOU BASKETS ARE THE BEST" whether of CANVAS or POUNDED ASH which has a national reputation, and are used extensively by the Government.

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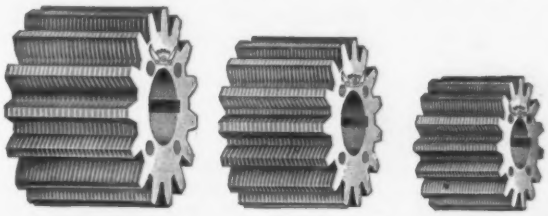

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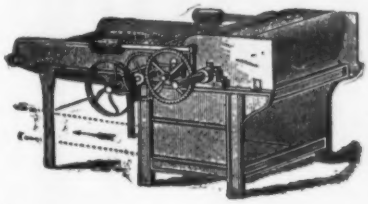

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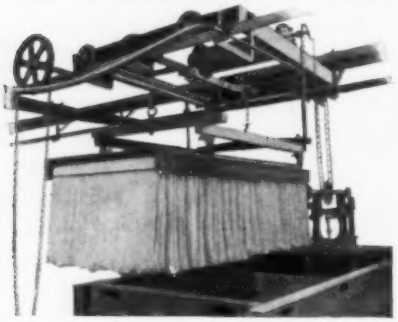
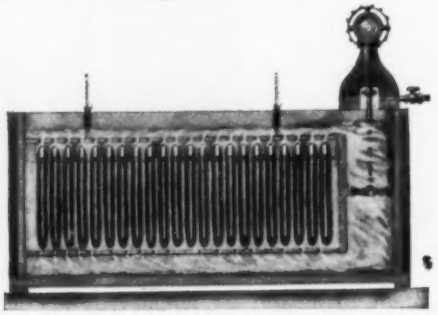
For Dyeing both Alizarine and Acid Colors on Yarn.

A PERFECT SKEIN DYEING MACHINE.



STYLE A. Showing 300 pound Yarn Machine, with removable dye-sticks.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
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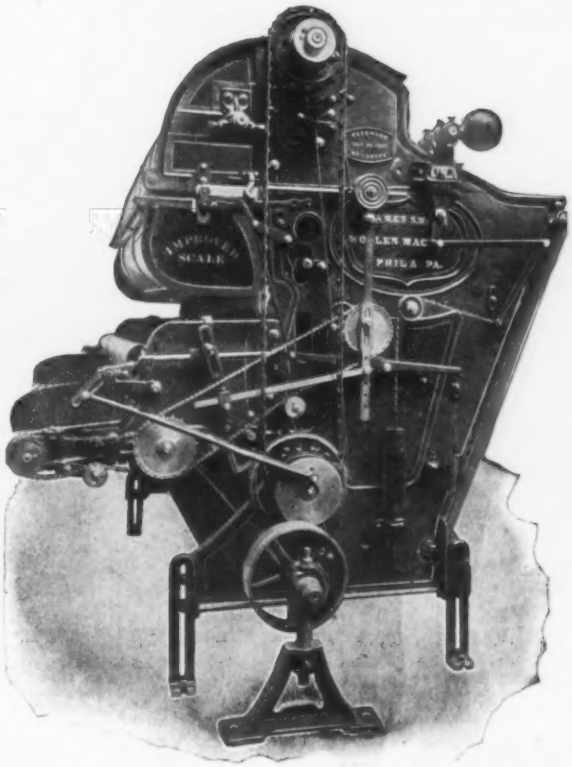

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Transient ads., Wants, For Sale, etc., to go on Classified pages can be taken up to the 4th of the month of publication.

We are always pleased to co-operate with advertisers in preparing attractive advertisements, and strongly recommend frequent change of copy, which increases the interest, and, therefore, the beneficial results of the advertising. We will cheerfully change copy as often as may be desired, providing it reaches us in time, but we cannot promise changes for next issue unless received as above stated.

The Official Directory of the Textile Industries of the United States and Canada,

is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

Foreign Advertising Bureau.

We are in close touch with all foreign textile journals and have their advertising rates on file and act as their agents for receiving advertisements and subscriptions. Any American textile advertisers wishing to advertise in Great Britain or the Continent may do it through our Foreign Bureau, which will advise as to best papers to use for different purposes, estimate the cost, prepare a correct technical translation into the foreign language, and attend to all details, correspondence, etc., including the payment of bills, so advertisers will have no more trouble than if placing an ad. in the TEXTILE WORLD RECORD.

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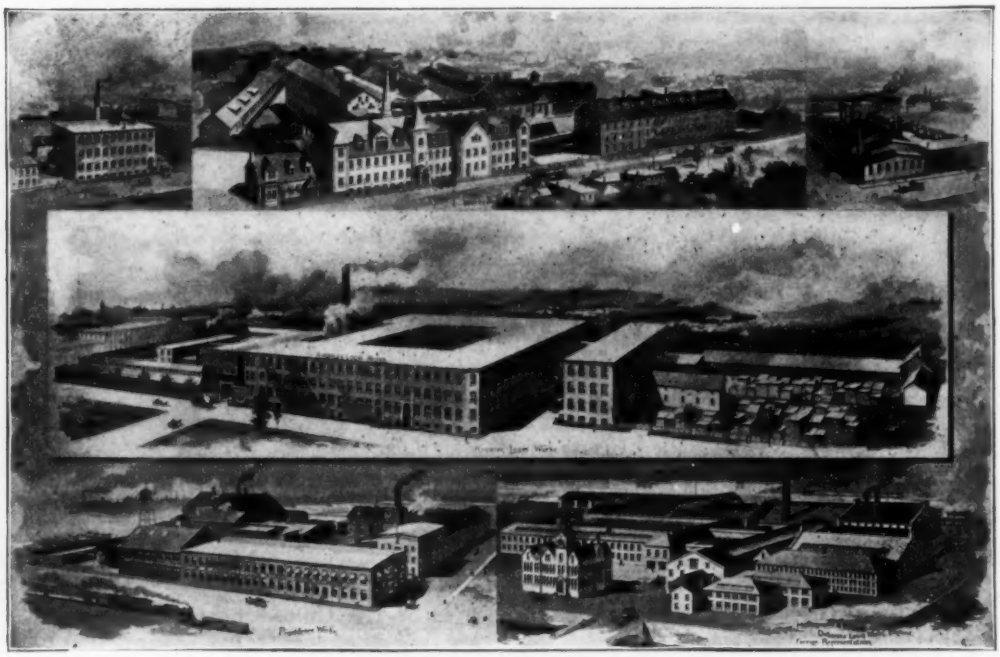

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We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

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We sell all textile books at publishers' prices. We publish technical books, especially on textile subjects and make liberal arrangements with authors.

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TEXTILE WORLD RECORD

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The Textile World and Textile Record.

VOL. 25. (NEW SERIES.) JUNE, 1903 No. 3.

Monthly Comment.

The Use of Shoddy.

Some one connected with one of the Boston dailies found an estimate of cost of woolen goods in which the composition of the face warp was stated as:

30 per cent. wool,
30 per cent. shoddy,
40 per cent. cotton.

The back filling on the same estimate was made up as follows:

25 per cent. waste,
65 per cent. shoddy,
10 per cent. wool.

These mixtures have been seized upon by the free trade press of the country and held up as proof of how the poor consumer is being swindled by the manufacturers of woolen goods. The writers of the articles profess astonishment that such formulas for the composition of woolen goods should be publicly admitted.

If all the sheep's wool grown each year throughout the world was divided equally among the inhabitants outside of the torrid zone, each person would receive about 19 ounces; this made into cloth for winter clothing would give each one a piece about a yard square.

It is needless to show how inadequate such a patch is to properly clothe any human being for twelve months. The use of cotton and shoddy to supplement the supply of wool is a blessing to mankind.

Shoddy is woolen stock which has previously been used in the manufacture of cloth. It is rags ground up. The fact that each person's share of new wool is but 19 ounces demonstrates without further argument the vital necessity for other material for clothing and the great benefit that shoddy is to the human race. It is far more necessary to society than is coal. We had a taste of a coal famine last winter. A strike of the miners would cause but slight inconvenience compared with the distress and suffering resulting from a prolonged strike of the ragman.

An Epidemic of Strikes.

The prevalence of strikes in nearly every branch of industry throughout the United States finds its counterpart in Europe and particularly in Germany at the present time suggests some mysterious influence affecting the toilers throughout the world. As in this country the strikes in Germany are started not so much for the advancement of wages as for the recognition of organized labor. For more than two years business has been greatly depressed in Germany and it is only recently that a halt has been made in the downward movement and signs appeared of the return of better times. While business

cannot be said to be improving it is growing no worse. The workers, however, are not content to wait for prosperity in general business before formulating their demands, but are organizing on every hand. The labor organizations are increasing rapidly in number and influence. Several serious strikes have occurred in the textile industry, and the manufacturer, while looking forward to an improvement in business, is brought face to face daily with the demands of his operatives for higher wages, shorter hours and above all recognition of the labor organizations.

A Modern Dyehouse.

A dyehouse was built last fall in Temesvar, Austria-Hungary, on a somewhat unusual principle, which it is said, the experience during the past winter has proved to be sound. The usual openings in the roof were dispensed with, the roof being tight. The dye vats were placed against the window piers at the side of the building, and the steam arising from them was carried from the room by electric ventilators placed in the piers near the roof. The room was heated by hot air from the dryers, carried through underground pipes and delivered to the dye house through openings in the floor. It is said that even on the coldest days there was no trace of mist or vapor in the room.

Bounty on Exports of Cotton Yarn.

Some months ago we noted an export bounty scheme of Japanese cotton spinners to revive their industry which has suffered severely owing to the loss of the export trade resulting from the continued fall in the price of silver. The Japanese Spinners' Association, which includes nearly all of the cotton spinners of that country, in accordance with the general agreement, paid a bounty of about 83 cents per hundred pounds on all cotton yarn exported. The spinners who bore this expense were partially reimbursed by the steamship company to which they granted a monopoly of the transportation of raw cotton from India to Japan in return for a certain portion of the freight charges. The principal advantage was, however, to be derived from the increase in the selling price of cotton yarn in Japan, resulting from the reduction of the available supply. This complicated and artificial arrangement has been in force for over six months. It has recently been abandoned owing to the complaints of inland spinners who were compelled by it to bear the expense of the export tax while they were not interested in the export trade.

Industrial Accidents in Massachusetts.

The laws intended to prevent accidents in industrial establishments are as strict in Massachusetts as in any state in the Union, and nowhere are the statutes more rigidly enforced. In spite of these conditions there were 1,491 accidents to persons operating machinery in this state in 1902, while there were in addition 990 accidents in industrial establishments, which were not due to running machinery. Of the whole number forty-eight (48) were fatal. Many of the accidents were, doubtless, due to that carelessness which workmen acquire from familiarity with machinery and long continued escape from casualties.

The Turn of the Tide.

Secretary North in the current issue of the Bulletin of the National Association of Wool Manufacturers, calls attention to two notable events in the textile industry. One is the end of the litigation between Black & Meyer and the estate of Charles J. Amidon, which is referred to in this issue under the caption, The Metamorphosis of a Cassimere. The other was a suit for breach of contract in refusing to accept goods. It was brought by the commission house of S. H. and O. B. Newhouse against L. and I. Livingston. The following account of the case is from the Bulletin:

> Another litigation, covering a question of equal importance to the manufacturer, has recently been determined in the Supreme Court for the county of New York, to which we also desire to direct attention. It was a suit for breach of contract; and the transaction was fairly typical of the "cancellation evil" to which manufacturers have been driven to submit in recent years; but for which they have always a remedy, if they choose to es-

tablish their rights in the courts of law. In 1899 Fleitmann & Co., of New York, through the commission house of S. H. & O. B. Newhouse, accepted an order from L. & I. Livingston for 500 pieces of granite homespun cloth. Relying on this contract, they gave an order to the New Albany Woolen Mills, New Albany, Ind., to make the goods, the order being duly executed.

The first case was delivered, accepted, and paid for at the rate of sixty cents a yard, the contract price. The Livingstons then refused to accept further deliveries. A tender of the rest of the order was made to the company, and on the refusal to accept, the Livingstons were informed that the remaining pieces would be sold for their account in the open market unless accepted at once.

The refusal to accept delivery was persisted in, and the goods were sold in open market at a loss of $3,600 from the contract price. Suit for this amount was immediately instituted by the commission house, but it was reached only recently on the court calendar. At the trial of the action before Judge Clarke, the plaintiffs testified that the only excuse given for not accepting the goods at the time was that "they were not selling." The defendants claimed that the goods were defective and unsatisfactory, and that they were justified in cancelling their order. Judge Clarke, however, held that this point was not well taken and that it was too late to raise the question of quality after the acceptance of the first case. Dealers prominent in the woolen goods trade were in readiness to testify to the quality and merchantableness of the goods, but they were not called on by the plaintiffs, as the Court ruled that the only question involved was one of simple contract, and he instructed the jury accordingly.

The defense also claimed that a higher price could have been obtained for the goods if greater diligence had been used by the plaintiffs. The jury evidently disagreed with this contention and rendered a verdict for $3,600 in favor of the plaintiffs.

This is said to be the first case in which the question of cancellations on the part of the buyer has come up in New York State, though suits for non-delivery have been frequent.

We cannot too highly commend the action of the commission house in the matter. In any other industry than the wool manufacture the case would have attracted no more attention than any other action for breach of contract. In the industry in question, an occurrence of the kind is so unusual as to enforce anew the lesson that the manufacturers are themselves chiefly to blame for having permitted such loose and unbusinesslike methods to obtain a foothold so strong that at times it results in complete demoralization in the trade.

For years the woolen manufacturer has submitted in the marketing of his goods to abuses which would not have been tolerated for an instant in other lines of business. During this time it has seemed as if a contract for the sale of woolen goods had no binding force upon the buyer. The result of these two lawsuits indicates that the seller of woolen goods has rights which the courts will recognize.

Cotton Lustring Process.

A process of lustring cotton cloth by passing it between finely corrugated calender rollers was discovered and patented in Germany some time ago. It gave a high silk-like lustre to cotton fabrics and promises to be an important improvement in textile processes. Two patents for the process were issued, one to Schreiner and Bemberg, the other to Kirkham. The rival claims for these patents have recently been brought before the German courts, and to decide upon the relative merits of the patents eighteen pieces of cotton cloth which had been lustred by the two methods were submitted to the court. Eleven of the pieces were finished by the Kirkham process in which the goods were passed between rolls having 50 corrugations per inch. The other seven pieces were finished with the Schreiner-Bemberg calenders having about 329 corrugations per inch.

A comparison of the finishers showed a marked difference between the two. Both had a silk-like lustre, but the lines made by the Kirkham machine were so far apart that they could be readily distinguished and gave a striped appearance to the cloth. The Schreiner-Bemberg lines were so fine, however, that they could not be distinguished by the observer, and the goods had a plain appearance.

It was demonstrated at the trial that the reflecting lines could not be blended by the Kirkham machine; the lustre is broken by a succession of dark lines which are not present in the Schreiner-Bemberg finish.

The test convinced the court and a decision was made in favor of the Schreiner-Bemberg patents, which are as follows:

1. Original Claim.—A process for producing a silky lustre on woven fabrics, or yarns, of vegetable or animal fibre, or a mixture of the two, by impressing the surface with numerous small facets meeting one another at various angles.

2. Claim as Altered by the German Patent Office on January 11th, 1900.—A process for producing a uniform silky lustre and not a watered effect, on woven fabrics, whether of animal or vegetable fibre or a mixture of both by impressing the surface with numer-

ous small facets meeting one another at various angles.

3. Claim as Now and Finally Altered by the Courts.—A process for producing a uniform silky lustre on woven fabrics, whether of animal or vegetable fibre or a mixture of both, by impressing the surface with numerous small facets meeting one another at various angles by means of plates or rollers engraved with from 130 to 520 lines per inch.

Appraiser of Woolens.

The appointment of Harwood Huntington as assistant appraiser of the woolen division at the New York custom house is a practical application of the common sense doctrine that a public servant should be specially qualified by education and practical training to serve the interests of the public in the department to which he is assigned. Mr. Huntington is a graduate of the Columbia School of Mines and has studied in European technical schools. He has supplemented this education with practical training in European and American mills. Mr. Huntington's duties as assistant appraiser will be to pass astrachans, haircloth, matting, wool and mohair plushes, ribbons, tapestry and upholstery goods.

British Cotton Industry at a Standstill.

The statistics compiled from John Worrall's directory of the British cotton spinning and weaving industry since 1882 tell an interesting and significant story. In 1882, when the first edition was published, there were 1,814 firms engaged in the business in Great Britain, operating 38,410,067 spindles and 485,264 looms. During the twenty years since then the number of firms has shown a slight tendency to decline, the firms in 1903 numbering 1,764. This may have been due to the general trend during the past two decades toward an increase in the size of manufacturing plants. The number of spindles increased to 43,054,227 in 1892. From that time to the present, the spindles fluctuated between 41,795,731 in 1898 and 44,620,950 in 1903. The gain during the past year was but 26,565 spindles, and today there are, according to these statistics, but 1,566,723 more spindles in Great Britain than in 1892. During this same period of 11 years the spindles in the United States show an increase of 6,200,000, of which 4,450,000 are credited to the South, where the increase in single years is equal to the British gain for the 11 years.

The figures as to the number of looms tell the same story. Growing to 615,719 looms in 1892, there have been but 31,653 added since that year, making a total of 647,372 at the present time.

Colored Cocoons.

Later reports give interesting details regarding the experiments noted in our last issue to determine how far the color of silk cocoons can be regulated by coloring the leaves on which the silk worms feed. It is well known that the silk secretion is either yellow, green or colorless, and heretofore it has been supposed that these different shades were due to the variations in the species.

MM. Levrat and Conte who are connected with the Lyons conditioning house, conducted the experiments. The results of their tests have demonstrated beyond a doubt that certain coloring matters applied to the mulberry leaves and eaten by the worm will pass through the intestines and form the natural coloring matter of the silk produced.

The experiments were made on two species of silk worms, the Atticus Orizaba and the Bombyx Mori. The coloring materials used were neutral totuylene red, methylene blue and picric acid. They began by painting the leaves with a solution of the coloring materials, then they separated the insects into different lots in order to vary the conditions under which each group were to be fed. The worms placed on the branches colored with totuylene red behaved very well without appearing to dislike the food. The body of the worm assumed a dark red which showed the presence of the dye in the blood. The silk produced was a rose color, forming a beautiful red cocoon. Similar results were obtained by the use of the methylene blue, but the worms did not eat the leaves so greedily. The result with picric acid was negative, the silk being colorless. These experiments were

repeated on two species of Bombyx Mori, one of which ordinarily produced yellow and the other white silk. From the former yellowish orange silk was obtained and from the latter a rose color, the depth of the color increasing with the duration of the feed.

The tests show that it is not only possible to obtain colored silk by coloring the leaves fed to the worms, but a wide range of shades can be obtained by varying the time in which the worms are left to feed on the colored leaves. The experimenters recognized the importance of determining whether the coloring was the result of a mere mechanical mixture or had become a genuine natural color. For this purpose they injected the coloring matter directly into the blood in such a way that it did not pass through the circulatory system of the caterpillar. The results showed that the color was a natural shade, produced by the same process that gives the natural color to ordinary silk. An examination of the color obtained showed that it was identical with the chlorophyl of plants. The yellow pigment found in ordinary yellow silk is identical with that found in the mulberry leaves on which the worms feed.

From the results obtained it appears that silk can be colored by feeding. It was found that taking a number of worms belonging to the same species and feeding them in the same way certain of them produced white, others green and still others yellow silk. An explanation of this phenomenon is to be found in the varying characteristics of the race, certain insects being able to absorb a greater amount of coloring matter than others.

Decline of the Hand Lace Industry.

The hand-made lace industry has been on the decline for many years. In Belgium the depression is especially severe owing to the large number of people there who depend upon this industry for their support. The principal reason for this decline is the smallness of the wages which amount to only 10 or 12 cents per day of 12 hours. In 1876 there were over 150,000 persons in Belgium making hand lace. In 1896 the number had decreased to 47,000, and the decline since then has been at a still more rapid rate. A Parisian lace dealer recently gave the following explanation of this movement:

"There is reason for believing that the Belgian hand lace industry is threatened with extinction and in France the situation of the lace workers is likewise desperate. There are several causes for this state of affairs. First, the changes in social conditions by which the extreme luxury prevailing at one time has disappeared. Formerly the noble ladies often ordered single garments costing $2,000; today they content themselves with garments at one-tenth the cost, and it is easily seen that we cannot afford to use hand-made lace for the cheaper apparel.

"Political changes have also increased the depression in the industry. Under the Empire lace was worn in profusion, being one of the customs that accompanied the imperial regime. The Republic is more economical; it has less love for luxuries. It may be noted also that the countries using the greatest amount of lace today are those in which the private fortunes are larger and where the form of government differs materially from that in France. England may be cited as an example.

"An important feature in the depression is also found in the caprice of fashion. We design and make up lace dresses at an enormous cost, the manufacture of which requires a large number of workers. Suddenly, no one knows why, the fashion changes and our garments are left on our hands without a market for them. It is this which makes us careful about laying in a stock of lace garments. The machine-made lace which is sold in such attractive forms at a very low price has also had an important influence in depressing the market for the more expensive hand-made product."

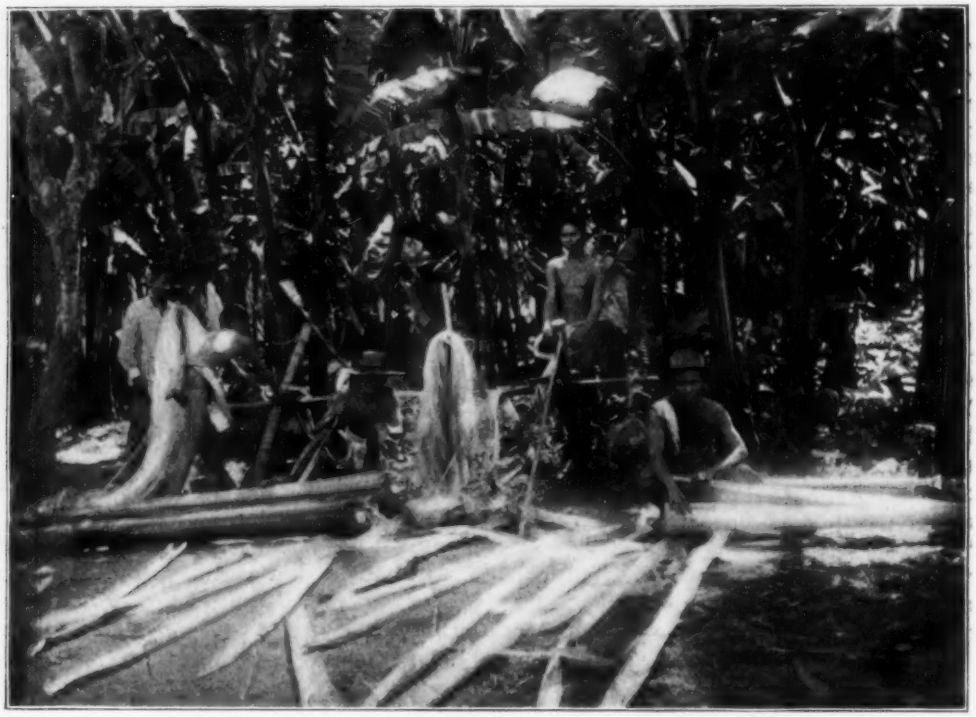
Cloth Examining Table. Schiele & Co., Eilenburg, Germany, are introducing to the trade a new table for the examination of woven fabrics. A measuring device is attached to the table also a section of plate glass which enables the goods to be "throughlighted."

The Manila Hemp Industry in Danger.

The cultivation of hemp is the chief industry of the Philippines. A considerable portion of the inhabitants of the islands are engaged in it and Manila hemp, so called from the fact that Manila is the chief shipping port for this product, is known throughout the world for its excellent quality and long sound staple.

Last month we called attention to the peculiar tariff situation which promised to place the United States in control of the Manila hemp trade of the world. This month it is our duty to call attention to a most serious danger that threatens this industry and which, if not averted, will ruin the deservedly high reputation that Manila hemp now enjoys in the markets of the world, destroy the otherwise bright prospects of a great industry and cause untold loss to every one engaged in it including the poor ignorant native whose natural cupidity is directly responsible for the present crisis.

For some time past there have been general complaints among the cordage manufacturers concerning the poor quality of the hemp shipped from the Philippines. It has been discolored and so tender as to make it impossible to manufacture the material into rope of the required strength. The cause of the trouble can be best stated by giving a brief account of the various operations in preparing hemp fibre for the market.



CUTTING, PEELING AND CLEANING HEMP IN THE PHILIPPINES.

Our illustration shows a party of natives on a hemp plantation engaged in the first process in which, as will be learned later, the cause of the present trouble is found. The hemp trees, measuring from six to eight inches in diameter and weighing from 50 to 100 pounds each, are cut down and then peeled into strips. Two of the natives in the

picture, the third from the left and the one at the extreme right, are engaged in the operation of peeling the trees, which requires much skill and special knowledge in order to select and separate the fibre yielding portion of the trees from the worthless part. Only a small part of the tree is rejected, nearly all being peeled into strips such as are seen in the foreground.

The selected strips are next passed to the cleaners, two being shown in the scene, the second and fifth from the left, who remove the pith or *carne* from the strips, retaining the hemp fibre. A very large proportion of the strips consists of this pith, a whole tree yielding but 1 to 1 1/2 pounds of pure fibre. The device used for this work of cleaning is of the rudest description. That at the right of the illustration consists of an upright held in position by a brace extending from the top into the ground at some distance from the base. A knife with a dull edge on the lower side is fastened at one side of the upright and is plainly visible in each of the machines in the picture. A horizontal lever of wood is placed just below the edge of this knife and fastened so as to swing on a pivot in the upright. A weight, in this case a heavy stone, is suspended at each end of the lever. One weight serves to keep the edge of the lever pressed against the knife, the other tends to draw it away from the knife. The native throws the right hand weight into action by foot power. This opens the knife and he then inserts one of the hemp strips. Upon releasing the weight with his foot the other weight raises the lever and pinches the strip of hemp tightly between the lever and the knife. The strip is then pulled lengthwise and this strips all the *carne* (pith) and other foreign substances from the fibre. Two or at most three drawings like this are sufficient to clean a strip properly.

This operation requires much strength and a great deal of skill. A man who has not been trained to the work finds upon the first attempt that the strip is so firmly held between the knife and the lever that his entire strength is not sufficient to budge it. Even with the knack which the native possesses the operation is extremely laborious, and it is natural that he should eagerly welcome any means of lightening it. Such means he finds in nicking his knife, giving it a fine saw tooth edge. Thus equipped he can do twice as much work as with the straight edged knife, or rather, he can turn out the same amount of fibre with one half the exertion. The difficulty with the nicked knife, however, is that it does not remove and clean the hemp properly. With the straight edge every one of the fibres is subjected to the same high pressure, but with the saw tooth edge clusters of the fibres slip through the spaces made by the nicks, and none of them are squeezed as they should be in order properly to remove the pith. The result is that more or less of this *carne* (pith) is left in the hemp and causes fermentation which rots and discolors the fibre.

For cutting, cleaning and drying the hemp the cleaner receives one half of the hemp or one half of the proceeds of the sale of the product, the other half going to the owner of the plantation. This one half amounts to from 2 to 3 cents per pound and a good workman can make with a straight knife about 25 cents per day. Many attempts have been made to improve the methods of cutting and cleaning hemp, but all have resulted in failure, the reasons for which are as follows: The machines, which do the work well, require power and this is not available on the hemp plantations, the most of which are well up the mountain side and reached only by foot or bridle paths, over which it is impracticable to take portable machines even if the necessary power could be obtained. Stationary machines, when installed at a central station have quickly exhausted the supply in the immediate neighborhood and it has been found necessary to go eight or ten miles for material to keep them in operation. It is not feasible to carry the trees so far on account of their great weight and the necessity of cleaning quickly after cutting to prevent fermentation. For these reasons the native with a knife fixed in a rude frame remains indispensable to the cultivation of Manila hemp.

The hemp is next hung in the sun where, if properly cleaned, it dries in about two hours. If the *carne* or pith is left in it the fibre is usually but partially dried and the remain-

ing moisture helps to rot the stock. Ordinarily the partly cleaned hemp does not begin to rot until some time after it has been dried and bundled. The result is that the material may reach the shipping port in apparently good condition, be sold there and shipped to America or Europe. During the passage the hemp is liable to heat and rot, the condition not being discovered until it reaches its final destination and is offered for sale or opened up in the mill where it is to be used.

This trouble is by no means a new one. It has existed from time immemorial and under the Spanish rule met with the most energetic,

DRYING HEMP IN THE PHILIPPINES.

arbitrary and effective measures for its repression. Many years ago, during a recurrence of the difficulty the hemp merchants banded together and refused to handle the stuff. The matter was brought to the attention of the Madrid government and orders were issued to the *capitan* of every *pueblo* in the islands to seize and destroy all improperly cleaned hemp within his jurisdiction. This order was carried out to the letter and the natives saw the hemp that they had cleaned with nicked knives burned in the market place, a total loss to themselves. This stopped the evil almost entirely and the practice of destroying badly cleaned hemp was continued until the islands came under the rule of the starry banner. Then came a new order of things. The arbitrary rule of the Spaniard gave way to the government based on the American Declaration of Independence. It was not long before the wily Filipino found out that this Declaration guaranteed life, liberty and the pursuit of happiness to him under ordinary circumstances, and he was quick to make practical application of this theory to the work of cleaning hemp. He at once took the liberty of nicking his hemp knife and the work of so-called cleaning went merrily on. He found his labors lightened, his wages increased, his working hours reduced and himself able to devote much more time to the pursuit of happiness which consists in sleeping, cock fighting, or, arrayed in a spick and span loin cloth and a plug hat, promenading in the cool of the evening up and down the boulevard of his native *pueblo* by the side of his dusky mate.

Meantime the product of his labors, was rotting in the holds of the ships and the result has been a loud and unmistakable protest from our cordage manufacturers against the rotten and discolored hemp that is coming from the Philippines. These protests were at first met by the American authorities in the islands with the statement that they could not interfere with the work of our brown brothers in cleaning hemp. Such interference with personal liberty, they said, was impossible under the American form of government.

The evil continued to increase and the outcry grew louder. Finally the Secretary of the Interior in the Philippines was induced to call a conference of hemp merchants in Manila to consider the question and propose remedies. According to a recent Washington despatch these recommendations are of the most drastic character. The merchants recommended that all hemp badly prepared or containing an excess of pith or which is weak or rotten, should be declared adulterated and fraudulent; that the use of nicked knives should be prohibited; that, it being evident that any hemp cleaner found with a nicked knife in his possession, intended to produce adulterated and fradulent hemp, he should be suitably punished; that the hemp cleaners should be prohibited from leaving hemp trees uncleaned more than twenty-

four hours after they had been cut down, so as to prevent putrefaction; that an inspector should be appointed for each hemp district to enforce the regulations; that one month be allowed for marketing the hemp on hand, after which all adulterated and fraudulent hemp should be confiscated and destroyed and those responsible for it should be punished, and that it should be made a penal offence to mix hemp with inferior fibres or other substances decreasing its quality and value.

The hemp merchants are practically powerless in this matter. The trouble, as we have seen, is caused by improper cleaning on the hemp plantation right after the tree is cut down. The merchants at the ports must either buy what is offered to them or go out of the business. It has been proposed to place inspectors in the Manila press houses to inspect the hemp and reject all that is improperly cleaned. This might help matters, but it cannot cure the trouble which can be stopped only by striking at its root as was done under the rule of the Spaniard. It is asserted that such measures are impossible under our form of government. In reply to this it is said that measures fully as drastic are employed here in the United States to protect society.

The government protects the people from the evils of adulterated milk, butter and other food stuffs. At the present time New England is under a strict quarantine to prevent the spread of the foot and mouth disease among cattle, thousands of which have been killed by order of the government and with but partial recompense to the owner. It is but a few weeks ago that the Boston wool trade was threatened with a tie-up on account of this quarantine. If such interference is justifiable why cannot the cupidity of the Filipino hemp cleaner be restrained? In building operations, in moving heavy weights, in navigating the seas, in hundreds of other occupations, the breaking of ropes is likely to cause great loss of life and personal injury. Our manufacturers cannot make strong rope from hemp cleaned with nicked knives. Why, then, can not this pernicious practice so dangerous to society, be restrained? Such restraint can in no way injure the Filipinos. On the contrary it will be of great benefit to them. The present state of things if allowed to continue threatens ruin to the Manila hemp industry upon which so many of the natives depend for a livelihood. If, on the other hand, the improper cleaning of hemp is stopped, a great future lies before this, the leading industry of the archipelago.

Men who have had years of experience in the Philippine hemp industry declare emphatically that it is useless to try to control the Phillipine hemp cleaner by arguing the matter with him. He lives in a hot and enervating climate and earns a pittance under a burning sun at a back breaking job which he can lighten one half by nicking his hemp knife. He knows little and cares less about the results in America and Europe. He can see and cares for only the immediate results to himself. We doubt if there is a man in this country who under like circumstances would not do exactly the same thing.

While no blame should rest upon the individual Filipino hemp cleaner, society both in and outside of the Philippines should be protected. The interests of all demand that this practice of cleaning hemp with nicked knives be stopped at once, and it is to be hoped that that part of the Constitution which has followed the flag into the Philippines, will be found elastic enough to allow the application of the proper remedy without delay.

Tubing Apparatus. E. Jagger & Co., Oldham, England, have brought out a new and improved apparatus for applying tubes to mule spindles. The particular change has been in the matter of weight, the new tubes being much lighter and consequently better adapted for use by young hands. The capacity has been greatly increased, the present being for 650 to 680 tubes. It is claimed that by its use tubes can be placed on twenty spindles as well as on one by the old method.

Of the 7,032 ships which cleared last year from Australian ports 6,308 flew the British flag. Only 724 were foreign.

Germany has twenty-one universities, Italy twenty-one, Austria ten, Russia eight and Great Britain eleven.

A Fair Price for Cotton.

The recent advance in the price of cotton has, as a matter of course, interested the whole world. It means an increase in the cost of the clothing for everyone of the inhabitants of the earth from the American, who is the largest consumer of cotton cloth, to the native of Senegambia whose wants in the clothing line are satisfied by a scanty loin cloth. It would be difficult to name a commodity in wider use than cotton. With the exception of the dwellers in the Arctic regions every one uses cotton cloth. It is a necessity for which there is no substitute. No other textile material will answer the purpose as well, and it is for this reason that a permanent increase in its cost must be borne in greater or less degree by nearly every member of the human family.

The world's annual cotton crop is approximately 14,500,000 bales of 500 pounds each, a total of 7,250,000,000 pounds. This vast quantity of cotton is consumed each year, there being practically no surplus carried from one year to the next. In fact during the past three or four years consumption has pressed close upon the heels of production and the cotton mills of England and the continent of Europe have been forced into idleness to a greater or less extent owing to the shortage of raw material.

Taking, then, the annual production of 7,250,000,000 pounds of cotton as a measure of consumption by the 1,500,000,000 people of the earth, we find an average consumption of cotton per capita of about 5 8/10 pounds. The use of cotton is, however, by no means uniformly distributed throughout the world. As might be expected, the American, in possession of the richest portion of the globe, finds himself able to use the most of the cotton as he uses the most of the other good things of life.

Estimating that our excess of cotton imports over exports is equal approximately to 100,000,000 pounds of raw cotton, we find that the 80,000,000 inhabitants of the United States consume annually 2,163,000,000 pounds of cotton, or 27 pounds per capita. This leaves 5,087,000,000 pounds to supply the wants of the 1,420,000,000 people inhabiting the rest of the earth, or 3 6/10 per capita. We thus find that the American, as a cotton consuming animal, is equal to 7 1/2 of the other members of the human race. In other words, our 80,000,000 are, as cotton users, equal to 600,000,000 people outside of our borders.

This is merely evidence of the well known fact that the purchasing power of our people is far in advance of that of the rest of the world. It is a fact that should be borne constantly in mind when considering propositions for an exchange of markets by means of reciprocity treaties with foreign nations. Such bargains are bound to be of the jug handle variety if based upon a mere balance of tariff schedules without taking into account the immense superiority of our market as an absorbent of goods.

Turning our attention to the sources of the cotton supply we find even greater inequalities of distribution, and here again we find America far in the lead. The accompanying chart shows more plainly than figures can the way in which the production of cotton is

THE WORLD'S PRODUCTION OF COTTON.

distributed throughout the world. 5,384,000,000 pounds or nearly three quarters of the world's cotton crop is grown in our Southern States, the remaining quarter consisting principally of Indian cotton which is short, dirty,

and tender, fit only for the coarsest grades of goods. This vast product, 5,384,000,000 pounds, from our Southern States is equal to 67 3/10 pounds per capita of our population, while the cotton crop of the rest of the world, amounting to 1,866,000,000 pounds, is equal to but 1 2/10 pounds per capita of the population outside of this country. Summing up these statistics, each American uses 27 pounds of cotton and produces 67 pounds, while each foreigner uses 3 6/10 pounds and produces but 1 2/10 pounds. This explains why the sunshine and the rain in the Southern states are watched as anxiously by the European spinner as by the Southern planter himself.

For each person in the United States there are, approximately, 18 people outside. Uncle Sam, therefore, may be likened to a planter who raises 67 pounds of cotton, his family consuming 27 pounds of it, and who sells the surplus of 40 pounds to 18 of his neighbors. These neighbors must have the 40 pounds of cotton. They could use more to advantage and each year sees their wants in this direction growing more urgent. Under these conditions it requires no extraordinary reasoning powers to determine whether a high or a low price for cotton is for the benefit of the aforementioned farmer.

The following table gives the average price of middling cotton in New York for each of the fifty years ending with 1902:

AVERAGE PRICE PER POUND FOR MIDDLING COTTON.

Year.	Price.	Year.	Price.
1853	11.02	1878	11.22
1854	10.97	1879	10.84
1855	10.39	1880	11.51
1856	10.30	1881	12.03
1857	13.51	1882	11.56
1858	12.23	1883	11.88
1859	12.08	1884	10.88
1860	11.00	1885	10.45
1861	13.01	1886	9.28
1862	31.29	1887	10.21
1863	67.21	1888	10.03
1864	101.50	1889	10.65
1865	83.38	1890	11.07
1866	43.20	1891	8.60
1867	31.59	1892	7.71
1868	24.85	1893	8.56
1869	20.01	1894	6.94
1870	23.98	1895	7.44
1871	16.95	1896	7.93
1872	22.19	1897	7.00
1873	20.14	1898	5.94
1874	17.95	1899	6.88
1875	15.46	1900	9.25
1876	12.98	1901	8.50
1877	11.82	1902	8.75

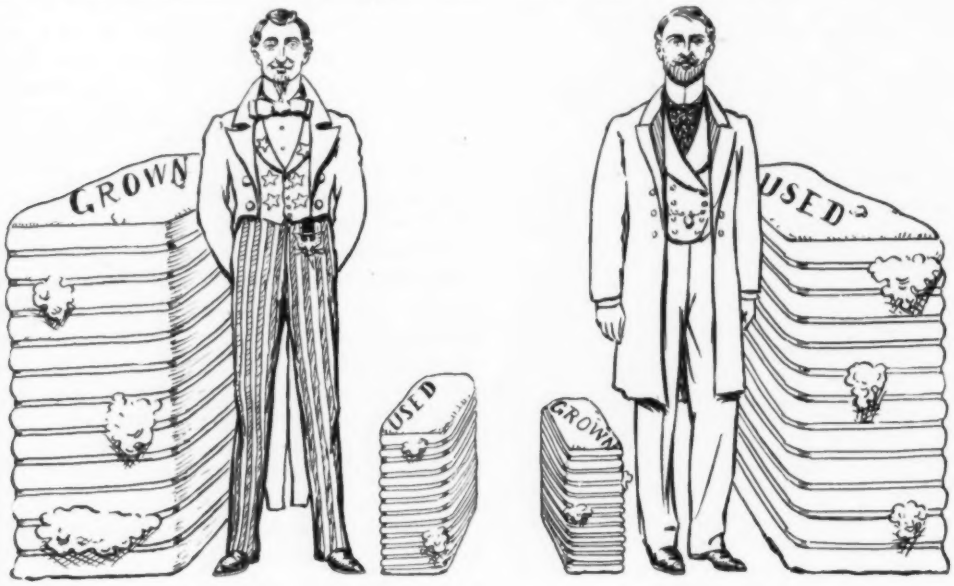
From 1853 to 1861 the average fluctuated between 10 3/10 and 13 1/100 cents. The cotton famine, due to the civil war, caused the average price during the next five years to vary between 31 3/10 cents and $1.01 per pound. The prostration of the South following the war kept the average between 17 and 31 6/10 cents for the next eight years. It dropped to 11 8/10 cents in 1877 and from that time to 1890, a period of fourteen years, a fairly uniform level was maintained. In only one year, 1886, of this period did the average fall as low as 9 3/10 cents. For the rest of the time the fluctuations were confined between 10 and 12 cents.

Beginning with 1890 and cotemporaneous with the success of the free trade movement in this country, a decline in cotton prices started in, carrying the average to 5 9/10 cents in 1898, the lowest on record. For the past three years, 1900, 1901 and 1902, the averages have been 9 1/4, 8 1/2 and 8 3/4 respectively. The present year, 1903, began with the price at the average (8 3/4 cents) for the preceding twelve months, and since then the tendency has been continuously and strongly upwards until in the month just closed the price reached 11 3/4 cents, the highest in thirteen years, having risen to this level from 8 2/10 cents last October.

The average price of cotton during any considerable period is, like all other prices, regulated by the balance of supply and demand, and as to the state of this balance in the future one man's guess is as good as that of another. We have certain well established facts to guide us in forming a judgment as to what is a fair price for cotton. We know that the world has been short of cotton for three or four years; that the determined efforts to find new sources of supply promise no great measure of success. The most promising of these enterprises is in Togo, German West Africa, and no one who read the story of the work there, as told in the April 1902 issue of the Textile World by the Tuskegee graduate who is in charge of it, can believe that Togo can ever threaten the supremacy of Am-

erican cotton. We know that the consumption of cotton will increase with the development of uncivilized races and the settlement of undeveloped territories.

With these prospects, all tending toward higher prices, it is difficult to escape from the conclusion that 10 7/8 cents, the average price of cotton for the twelve years from 1879 to 1890 inclusive, is more in harmony with present conditions and prospects than



AMERICAN. FOREIGN.

THE WORLD'S GREAT COTTON BULL AND BEAR.

is 7 8/10 cents, the average for the succeeding twelve years from 1891 to 1902 inclusive.

During the first period from 1879 to 1890 the business of the country had various ups and downs, but on the whole enjoyed a fair share of prosperity. During the last period of twelve years, from 1891 to 1902, on the contrary, the whole world suffered extreme business depression, and nowhere was this more acute than in the United States. This tends still further to strengthen the belief that the recent advance of cotton to 11 1/2 cents indicates the restoration of cotton prices to the former high level, perhaps to a still higher one.

The recent advance is popularly attributed to the work of a pool engineering a corner, and rumor has persisted in placing one of the greatest individual fortunes in the country behind this pool. This may or may not be so, but the other conditions stated are undisputed.

Assuming, then, that 11 instead of 8 cents is to be the level for the next few decades what does that mean to this country? Continuing the comparison of the country to an individual planter it means that he will receive $4.40 for the 40 pounds of cotton per capita he had for sale, instead of $3.20 as formerly. To be sure the 27 pounds of cotton used in the family will be valued at $2.97 instead of $2.16 as before, but then this makes no difference to the family as a whole since it is a home product. The gain to the family results from the increased price for the part that is sold, amounting to $1.20.

An individual planter doing business under the conditions stated, would welcome the rise in the price of cotton as an unmixed good. When, however, eighty millions take the place of one, the increase in the price is viewed with alarm in many quarters. But why should there be any difference in the two cases? Instead of selling 40 pounds we are selling 3,221,000,000 pounds of cotton to foreign countries, and instead of receiving

$257,680,000 we get $354,000,000 for it, a difference in our favor of $96,630,000. This is no trifle, even for the United States. We can use it in our business. In two years it would pay the estimated cost of the isthmian canal, an enterprise to which we are pledged.

Turning to the domestic consumption we find that the 27 pounds per capita is equal to 2,163,000,000 pounds for our 80,000,000 people and that we must charge ourselves $237,030,000 instead of $173,040,000 for this quantity of home produce, a difference of $64,890,000 or about 81 cents per capita per year.

This sum is simply transferred from the people as a whole and placed in possession of a portion of them who, under a proper distribution of such proceeds, would be in great part the inhabitants of our Southern States. Added to the increase in the price of the cotton sold abroad it would mean the greater part of the $161,000,000 placed to the credit of the South.

A portion of this amount may be diverted into improper channels by reason of speculation or, to be more exact, gambling in cotton in our exchanges. This, however, is another question and should not be allowed to confuse us in considering the effects of a permanent increase in the level of cotton values.

The change from an 8 to an 11 cent level would, doubtless, entail inconveniences and loss on manufacturers of and dealers in cotton goods, owing to the fact that goods might not advance as rapidly as the raw material, but such inconvenience and loss would be trifling compared with the ultimate advantages to the whole country, and, consequently, to the manufacturers and dealers themselves, arising from the increased income derived from the sale of our surplus product to foreign customers.

There is no force in the objection that higher prices for cotton might stimulate production abroad and thus destroy our foreign market. The world needs a new supply of cotton; civilization waits upon it. The scarcity of cotton is a serious danger that now threatens mankind, and a new source of supply would be an inestimable benefit to the human race. If a supply should be found that would drive our Southern planters out of the business, it could be looked upon only as a blessing to the world as a whole. There is, however, no prospect of such a discovery. It is practically certain that there will be no such discovery. We are trying to consider the case from the standpoint of enlightened American selfishness and are forced to conclude that the substitution of 11 cents for 8 cents as a permanent price level for American cotton should be welcomed by every patriotic American.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

Business in this branch of the market shows considerable improvement over last month; satisfactory duplicate orders have been received from all over the country, more particularly from the Pacific coast and reports from men on the road indicate that the fall business will be of fair proportion. Double and twist goods are just now receiving the most favorable attention. Too much shoddy and cotton enter into the manufacture of this cloth to made the demand lasting. They, however, present an attractive appearance and it would take an expert to tell just how much they have deteriorated. Duplicate orders are satisfactory on black Thibets and unfinished worsteds. Oxfords are having considerable demand. Kerseys are slow and heavy. Home-spun and crashes are meeting with ready sale for the spring of 1904. The market shows a hardening tendency and some advances have been made; up to the time of writing few cancellations have been received. Deliveries are fairly prompt and indications point to Melton Oxfords as the most in favor for fall overcoatings.

DRESS GOODS.

The business in this department continues satisfactory. Liberal orders for Scotch, English and Irish tweeds have been taken for

fall on goods of this character. When they made their first appearance early in the spring they were looked upon with a certain amount of disfavor, but buyers find that they are eminently suitable for the new style of costume now so much in vogue. At Fig. 1 is shown a fabric by Holden & Leonard. This is of the Scotch effect order and comes in a variety of combinations and effects; it is 44 inches wide and will yield the jobber a good margin at 55 cents. Silk and wool enter into the manufacture of this fabric, which results in a very dressy appearance at a low figure and will undoubtedly take well among the masses.

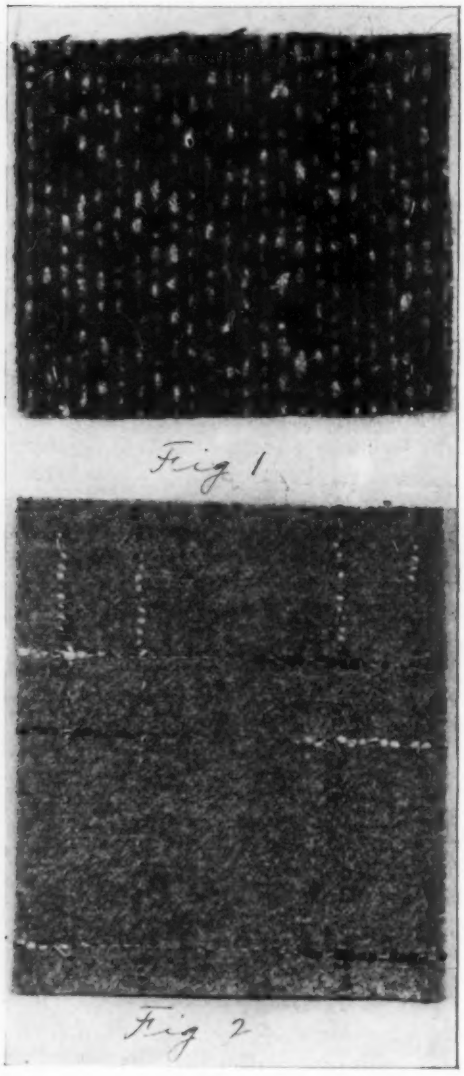


Fig 1

Fig 2

Zibeline is still first in favor for fall wear, both the long and sheared short haired in every possible form of combinations. Both yarn dyed and wool dyed have been actively sought for. Quiet colors have proved to be most in demand, although small, invisible checks and other novelties have taken well among the better class of trade.

Broadcloths, Venetians and Thibets have been ordered in fair quantities.

Nostrand & Moore are showing their Melton "Pladright" cloth, Fig. 2, on which they report having met with a splendid success. This cloth is 54 inches wide, 14 ounces and jobs at 95 cents. It is made in plain colors, stripes, broken plaids and checks.

Skidmore & Muller, selling through James Stearn & Co., are showing samples of high class novelties in camel's hair and burretted effects suitable for the exclusive trade and to retail at $2.00 and over. These high novelties come at 50 inches wide and 22-yard pieces. This firm are also showing some very stylish zibelines in tinted effects, to retail at $1.75 and $2.00.

The demand for veilings and sheer wool fabrics for current use is still very considerable. Duplicates are coming in quite freely. Etamines and nub effects are selling well and will hold the field for fall wear; these come in stripes, checks, splashes or broken checks. Twine clothes and fabrics of the order of canvas weaves are also well spoken of as being very much in favor for present wear.

The demand for mohairs is still unabated and importers state that until recently they were unable to keep up with the demand, but during the last few days several shipments were received which enabled them to fill nearly all the orders on their books. Black, navy, cream, silver grey and tan are the most popular shades; small, even weave white hair line stripes, shepherd's checks and small jacquard designs in addition to metallic dots are the most popular fancies. This active demand for mohairs and Sicilians is something more

than a fad; there is no other fabric that lends itself so readily for all manner of uses. Their light weight and resisting qualities make them pre-eminently suitable for summer wear and their lustrous sheen, appeal to women as no other fabric does; no other fabric possesses in such marked degree utility and stylishness combined.

What will be the prevailing fabric for the spring of 1904 is now a matter of conjecture; light weight cheviots and wool goods of a rough surface are now well thought of. The retailers are showing some very handsome costumes in linen, suitable for yachting and out-door wear; jacquard re-vestings have also caught the popular favor and are now being shown by the retailers in large and handsome varieties.

COTTON.

The excitement in the cotton market is now beginning to subside and a decline from the present fictitious value is expected by the trade; several of the sales agents interviewed expressed their indignation that a necessary commodity like cotton should be at the mercy of a clique of speculators to manipulate and boost at their own sweet will. The market is of necessity firm and strong; agents will only sell at value; the jobbers' stocks are low; several advances have taken place with every indication towards an advance all along the line. The conditions prevailing are unprecedented. Some of the most staple numbers have been out of the market for several weeks.

Buyers generally have been holding off as much as possible waiting for developments, placing orders only for their immediate wants. Whether this policy will prove to have been beneficial is questionable: those who early in the season anticipated their wants are now congratulating themselves upon their shrewdness and foresight and according to the prevailing conditions have every right to that happy condition of mind. Talk of curtailment and general advances are heard on all sides, but the conservative element predict a steadier market in the near future.

Pequot 9/4 and 10/4 have been out of the market for some weeks owing primarily to the scarcity of the raw material adapted for the manufacture of this standard cloth.

Hickory stripes have also been cleaned out. Otis checks have been advanced from 7 1/4 to 7 1/2. B. B. & R. Knight have advanced the price of "Domestic" wide sheeting 1/2 cent and "Fruit of the Loom" wide sheeting 1 cent per yard. Martin I. Cooley has advanced the "White Rock" and "Arctic" wide sheetings 1/2 cent per yard.

Taylor, Wendell & Co. have advanced all widths in both brown and bleached "Utica" sheetings, and Lonsdale cambrics to 10 3/4 cents. Amory, Browne & Co. have advanced "Lancaster" staple ginghams 6 1/4 cents. All Amoskeag ticks have been advanced by C. L. Bauscher & Co. 1/2 cent per yard. Fitchville 4/4 bleached has been advanced to 6 3/4 cents per yard. 56 by 60 brown sheetings are now quoted at 4 7/8 and 5 cents.

WASH GOODS.

A number of buyers are in market and have made a tour of jobbing houses on the lookout for odd lines of seasonable fabrics for hot weather wear. Lawns, percales, batistes and all classes of sheer fabrics have been eagerly sought for since the hot wave arrived. Jobbers report that good business has been done on all lines of this character and fair prices realized. Very few concessions have been made as yet. Stocks are by no means heavy for this time of year.

The white goods craze seems to have reached its zenith and have in some measure pushed colored goods to the bargain counters and basement; these white goods are to be seen in all manner of weaves, jacquard effects and heavy basket weaves being the most prominent. It is confidently asserted, however, that this craze will soon wear itself out, more especially among the exclusive trade and predictions are made that mauve and the dainty, delicate pastel tints will again soon reign supreme. Sheer mercerized fabrics, both plain and figured, are already becoming scarce; some numbers have been cleaned out and assortments badly broken.

SILKS.

The demand for black taffetas is assuming large proportions and manufacturers state that they are unable to keep up with the demand. The silk market is by no means in a satisfactory condition since the recent report

from European centres relative to the shortness of the raw cocoons. Mr. Schiffer of Pelgram & Meyer, when asked about the condi-

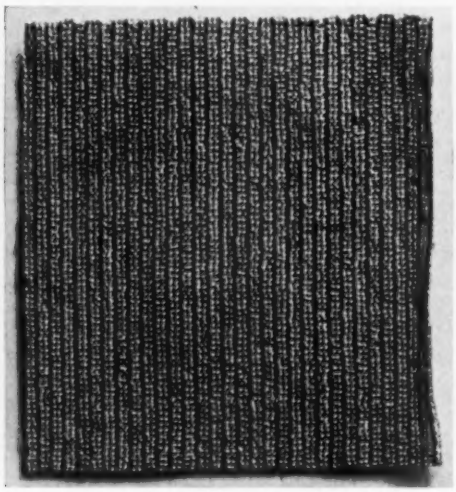


FIG. 3.

tion of the silk market, replied that it was in a state of chaos, that manufacturers did not know whether they were making or losing money. That there was a shortage was a certainty, but whether it was twenty-five per cent. as reported or ten per cent. they had no positively definite information, but further advices would be received within the next ten or fifteen days and will then be in a position to state more intelligently how much of an advance there will be.

The indications point to a strong demand for crepe de chine for fall wear. Large size orders have already been taken for this beautiful fabric. No other weave is quite so suitable for evening functions as this. Checks in small plaids in taffetas and clustered, dotted and small figured designs in foulards are the most staple of the fancies.

The velvet situation has developed considerable strength, orders being received quite freely. The spring business was not up to expectations, but the importers and manufacturers report very satisfactory business for tall.

Fig. 3 shows a gun-metal effect by A. Wimpfheimer & Bros. These possess the paon glace effect and come in neat hair line stripes and two-tone changeable effects; the newest plain changeable effects are navy blue over cardinal, royal blue over pink, green over orange and other attractive combinations. In addition there are a large variety of black and white small effects. It is thought that Persian stripes will not be so prominent as last fall, although some activity has been shown in designs suitable for waistings.

LININGS.

Converters report business as satisfactory. The tendency seems to favor light weight mercerized finish fabrics and imitation taffetas. The outlook for fall is promising. No material advances have been made but the trend of the market is firm and strong.

The Metamorphosis of the Cassimere.

A third of a century ago the cassimere was the aristocrat of woolen cloths for men's wear and the cassimere manufacturer was the aristocrat of the woolen industry. His fellow manufacturers looked up to him and he did not fail to look down upon them. That was before the rise of the worsted fabric, which later disputed the supremacy of the carded cassimere. In those days the cassimere was made only from the best and the finest of wool. The flocks of Ohio, Virginia, Australia, Cape Colony and Saxony supplied the raw material which was colored only with the fastest of dyes, spun and twisted into fine yarn measuring four or five miles to the pound, woven into closely set fabrics of attractive design and finally finished to give that soft, silky, pliant handle peculiar to the cassimere.

There were, to be sure, makers of so-called shoddy goods in those days, but they formed a sharply defined group of which those who bought and used the waste products of a cassimere mill stood at the head.

The panic of 1873 and the next few years of depression worked a change in the order of things. A few manufacturers of cassimeres began secretly to "work their own waste" into their goods, which they still called "cassimeres." At first these men were looked at askance by the regular cassimere makers and their product was put under the ban by the

trade. Slowly but surely the pinch of hard times reduced the purchases of woolen clothing by the people, while leaving the number of mills, middle men and retailers unchanged. To restore the demand the consumer must be tempted by lower prices. The demand for lower priced cassimeres was passed along the line to the manufacturer who sharpened his pencil and began to figure cost. The result was a reduction in wages and an increased use of "our own waste." Here and there a few cassimere makers protested vehemently that they used their "own waste" only in the backing, but its use in face and back of cassimeres soon became general and a few daring spirits boldly bought waste for cassimeres when their "own waste" ran short. The first step in the evolution of the cassimere of today had been taken.

About this time (1870-1880) a leader appeared on the scene. His cassimeres became renowned for their style, general make-up, attractive colorings, uniformity and above all their low price. Recognizing the trend of the times he resolved to give the clothiers clamoring for low priced goods what they wanted instead of trying to make them take what he wanted to make. He was thoroughly trained in the art of manufacturing, but his success was due mainly to the skilful selection and mixing of waste, shoddy, cotton and wool to produce desirable cloths. At first his low prices brought forth predictions of speedy bankruptcy, but as he continued to prosper, extending his business and discounting his bills while his high-priced competitors were doing the failing, the truth began to dawn on the trade and imitators of "Shoddy Bob", as he was called, sprang up on every hand. The better grades of noils, waste and shoddy were freely used and the success of the Bedford cassimere gave a stimulus to the mixture of cotton with wool and shoddy. Another step had been taken in the downward path of the cassimere.

All this time the worsted cloth was rising rapidly into favor, driving the carded cassimere from the fine goods trade. Some years later the free trade folly made its appearance, diminishing the market for goods and creating a still fiercer competition between the mills. The clothiers, mustered from the shrewdest people on earth, clamored for cloth "at a price", played one mill against another, took advantage of all the opportunities offered by the commission house system to depress prices. The manufacturers entered upon a still more desperate struggle to satisfy the demand for low-priced fabrics. They lost sight entirely of the once indispensable relation between cassimere stock and a sheep's back, and looked only for fibres that would spin to a given size at a given price. Profits were sacrificed that they might get a new dollar for an old one and avoid the loss caused by stopping the mills. The better grades of rags were added to the raw material of cassimeres, the yarn was spun still coarser, and what was once the finish of a cheviot made its appearance on every hand on cloths sold as cassimeres. Another step downward had been taken.

The hard times of the free wool regime grew still harder. Still the cry went up for cheaper goods. The manufacturer was in the last ditch. He could not reduce wages any further; he could not stop his mill without a loss. Again he sallied forth in his search for still cheaper raw material. The highways and byways were scoured, and so fierce was this struggle for cheap stock that, it is said, old hoop skirts, tin cans and other junk found their way into the piles of raw stock for the once proud cassimere. No matter if the resulting fibre was coarse, kempy, short and dirty and little better than flocks, it was used if it was cheap.

When this mass of mungo reached the finishing room in the form of cloth, flocks were freely loaded into it to increase the weight and reduce the cost. The result was astonishing. The ordeal through which the manufacturer had been passing for years had not been without its compensations. He had learned how to make a whistle out of a pig's tail.

He calculated the cost of his product and then offered the goods at cost. The clothier laughed in his face, told him such prices were impossible. Again he figured, this time the loss from closing his mill. If he could run at half that loss he figured he would be a winner. He lowered his price accordingly and this time obtained orders. At this stage

one manufacturer, Charles J. Amidon of Wilton, N. H., actually sold the Caxton cassimere 55 inches wide and weighing 22 ounces for 75 cents when territory wool was selling at 45 cents per pound. It was a thing of beauty but not a joy forever. It was offered to Black & Meyer, clothiers of Rochester, N. Y., on May 11, 1898, by the selling agents in the following discreet letter:

Messrs. Black & Meyer, Rochester, N. Y.

Dear Sirs: We send you enclosed three samples of Caxton Cassimeres cut from pieces. These were made originally on special order and have sold well at 75 cents.

We have seen the goods in the garment and they make up with a good cassimere face. Can deliver sample pieces at once. Yours truly,

Dudley, Battelle & Hurd.
(Per Bowne).

About 1,200 yards of the cloth were delivered to this firm, made into suits with showy trimmings to attract the consumer and found a ready sale. The transaction was apparently closed. But no! the last straw had not yet been loaded on the camel's back. Soon after the delivery of the goods Black & Meyer notified the commission house that the Caxton cassimeres were not giving satisfaction to the consumer, and in proof of this returned, with a claim for damages, a Caxton suit that did not "wear well." They asserted with much show of indignation that this 22 ounce cassimere sold at 75 cents per yard actually contained shoddy, that a cassimere should be made either of all wool or wool and cotton.

This claim was presented to Mr. Amidon. The goods had been sold on a commission of 7 per cent., subject to the regular discount of 7 per cent. and to an additional discount for time. They netted the manufacturer barely 60 cents per yard. From this was deducted the cost of manufacturing which could not be much less than 30 cents per yard, leaving 30 cents for raw material. A yard of the cloth weighing 22 ounces would require at least 30 ounces or nearly 2 pounds of raw stock. Territory wool cost 45 cents; cotton suitable for such purposes, at least 15 cents per pound.

The manufacturer stopped figuring. The time had come for the worm to turn. He notified his selling agents that he would see the clothiers in a much less beatific state than this world afforded before the claim would be allowed, and his decision was transmitted to Rochester in the following straightforward, manly letter:

Gentlemen: Your favor of the 18th and suit have been received. It is hardly to be supposed that goods at 75 cents per ya weighing twenty-two ounces or more and fifty-fc inches wide, will give any kind of satisfaction tc he wearer.

We cannot believe that any o ur men would represent such rubbish as being all wool and even if they were foolish enough to do so, any person of average judgment would know to the contrary. This is the result of the clothing trade pounding the goods and prices, and trying to get them cheaper and cheaper.

We do not feel that we are in any way responsible, and would be surprised if the goods had given satisfaction. When the clothing trade are willing to pay a fair price for merchandise they will get a fair quality of goods. We have returned the suit to you today.

Very truly yours,
(Signed) Dudley, Battelle & Hurd.

Black & Meyer then brought suit for $876, the price of the cloth, and Mr. Amidon resolved to fight it to the end. The jury disagreed at the first trial; a second trial had the same result. At the third trial the jury awarded damages to the extent of $832 to Black & Meyer, apparently on the grounds that a cassimere must either be made of clear wool or cotton and wool, for this was the only claim made by the plaintiffs.

In the meantime Mr. Amidon had died, but the fight against such an outrage was kept up. Upon appeal, the decision of the lower court was reversed and a new trial ordered. Notice of a new trial at the April term was given, and Mr. Weeks, the agent of the Amidon estate, had arranged for the attendance if his witnesses, when he received word that the plaintiffs were willing to compromise for a small sum. The offer was spurned, and a few days before the fourth trial was to begin, the plaintiffs abandoned the case, which was then dismissed by the court. They had found out that the cassimere of 1873 was not the cassimere of 1903. The metamorphosis was complete.

The litigation covered nearly four years and cost the defendants nearly $5,000. This expense, together with the trouble, was incurred by one individual manufacturer in a struggle against the extortions that manufacturers as a class have suffered for years. The final result is a victory for the whole textile industry. The benefit is general and we would record the event with much more satisfaction if the cost of the five years' struggle was distributed in like manner.

Market Notes From Paris.

(By our Special Correspondent at Paris.)

The market at present is very quiet; business was active during the month of March but has slackened considerably owing to the bad weather with which we have been favored for several weeks.

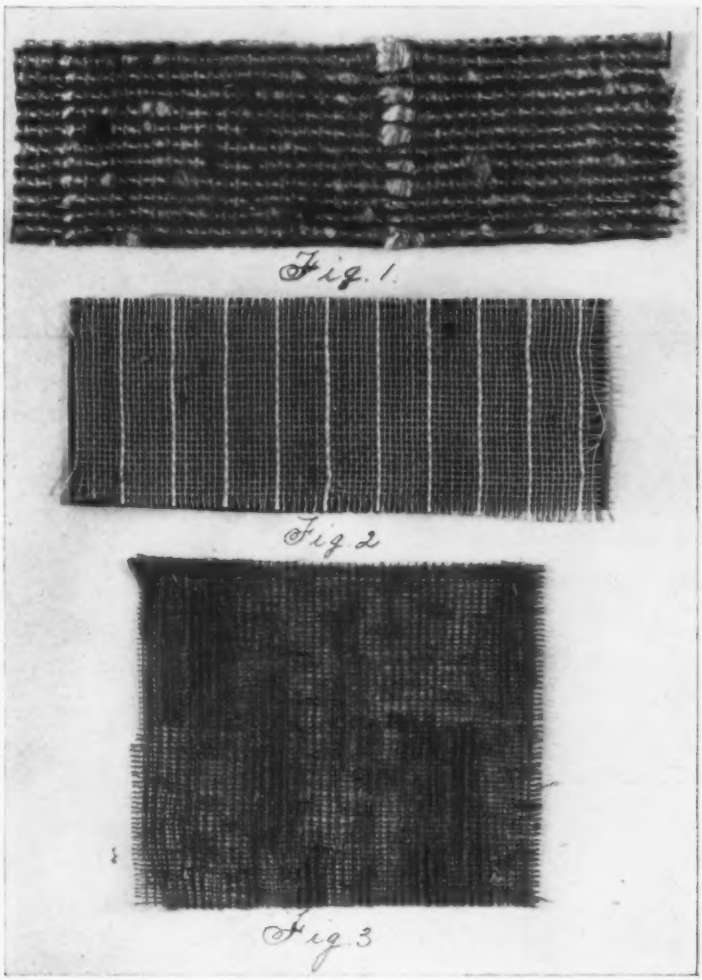


Fig. 1.

Fig. 2

Fig. 3

The fabrics which are most in vogue at the present time are those called *neigeux*, also many light weight fabrics, voiles and etamines. *Neigeuses* are made with a soft twisted filling containing lumps or bunches which form spots in the goods like snow flakes, as shown in the sample at Figs. 1, 2 and 4. Occasionally the effect is varied to show stripes as at Fig. 3. This class of goods is very difficult to manufacture, as it is more difficult to make defects in cloth than to avoid them.

Solid colors are used but little in voiles and etamines. The more popular styles in plain effects are those fabrics shown at Figs.

8, 9, 10, 11 and 12. The style shown at Fig. 11 has been a good seller along with the wool and silk cloths like Fig. 16. In low priced goods a very large business has been done

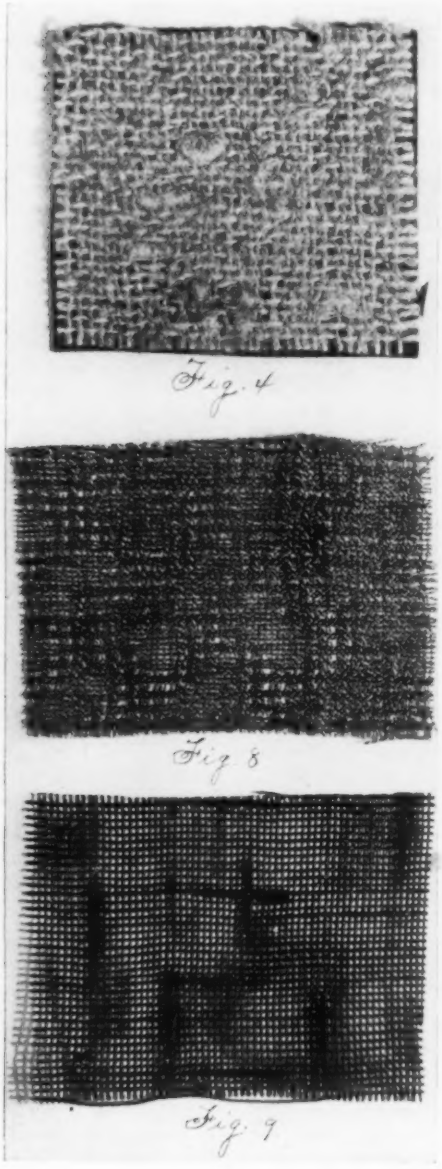


Fig. 4

Fig. 8

Fig. 9

in styles similar to those shown at Figs. 13, 14 and 15.

The buyers have by no means neglected solid colors in zibelines, some novel effects lately brought out being called zibeline *crispe* and *ondule*.

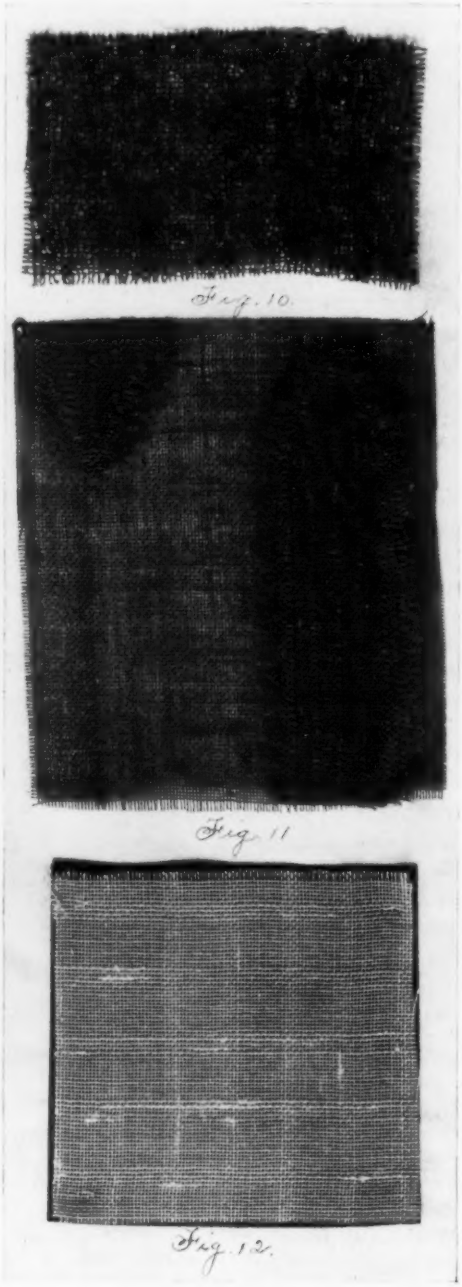


Fig. 10.

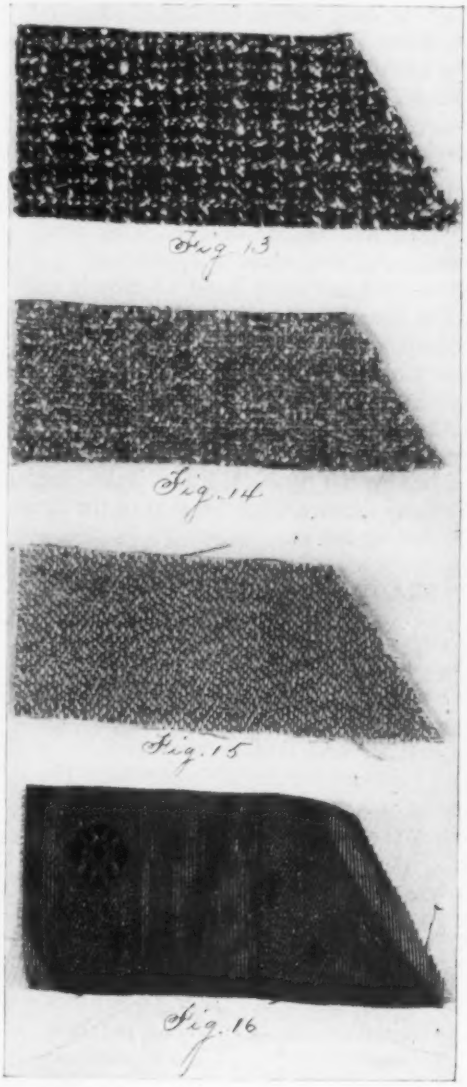
Fig. 11

Fig. 12.

[The novelties were referred to in the April issue of the Textile World Record as being among the latest things on the French market. We regret that the effects cannot be satisfactorily shown in half tone engravings, but any one interested can see them by calling at this office where we have samples of the goods. They are very attractive fabrics, the peculiar effect being obtained by an ingenious combination of weave, stock, and manipulation in finishing.—Ed.]

SILKS.

Orders have been freely given for silk embroidered with flowers and stripes, also for light taffetas and thick but very flexible net work fabrics. Scotch taffetas have been very popular, especially large plaids. Mousselaine de soie, grenadine and crepe de chine are also in good demand; transparent printed silks have met with good success, very beautiful effects being obtained with a colored ground work. The tendency for the coming season is strongly toward pastel shades.



ENGLISH TEXTILE MARKETS.

BY S. B. H.

(*Specially written for Textile World Record*)

Textile conditions in England are absorbing today a good deal of attention, the two principal leading raw commodities, namely, wool and cotton, romping in the third heavens of ecstasy and delight. Neither article seems at present to possess much ballast, for both alike are completely under the thumb of a strong shortage bogey, the cry being persistent and loud that markets are short.

Dealing first with wool, it does seem that supplies are very moderate, and that it is going to take the article all its time to go round. At the same time there need not be any unnatural haste born of fear to cover any prospective wants, for American manufacturers can rest satisfied that there is going to be sufficient raw stock to go round. Merinos are certainly occupying an exceedingly strong position, and it is now certain that the available quantity of fine wool at the succeeding London series of auctions will be very sparse this year out. This makes it absolutely certain that today's prices will continue, but it must not be forgotten that manufacturing needs of fine wools are very far from being big.

Here in Bradford there is pronounced quietness among fine merino spinners, while manufacturers of solid Botany cloths, such as worsted coatings and fine super dress goods, have not been as quiet for years. There seems to be a consensus of opinion that the position in the Botany department of the trade is one of increasing difficulty. Spinners are not keeping their frames running full time, in fact some are standing, and there is ample ground for the bitterness of the complaints made by all parties. Of course,

merino topmakers have been compelled in self-defence to ask more money, but whether or not they will be able to command it later on remains to be seen. The vital question seems to be: Will the present volume of business prove to be sufficient to keep merino values where they are? However short the supply, the actual consumptive demands must never be lost sight of, and this is very far from being satisfactory.

Bradford today in its merino trade finds things very awkward and bad to do. All parties I daresay could command trade to keep machinery going if circumstances did not compel them to ask more money, but the ultimate consumer remains still unreconciled to the fate which confronts him, hence he holds off. The bitterness against paying increased rates is very pronounced, and no matter how wool goes in London, fabrics buyers are not going to be rushed as they were in 1899.

Bradford's trade today, in fact, I might as well say the principal trade throughout the heavy woolen District of Yorkshire consists of crossbreds. Turn which way we will the production of "cheviots" engages our attention, and here looms are busy. Spinners of crossbred wools are exceedingly busy, thanks very much to some good Continental yarn orders. Prices continue to be very reasonable, and in their reasonableness we have the secret of their success.

All the cry seems to be for something cheap yet smart, and if today manufacturers are to reap success they must comply with these two requirements. It is no use here in England to produce cloths at $1.50 per yard, for where one piece of such cloth sells, one hundred pieces of 50c. to 60c. per yard 6/4 fancies are being sold. Both in men and women's wear fabrics all the rage is for chevioty woolens after the zibeline and Donegal tweed order, and all this means a large growing consumption of medium crossbred wools. This fact is emphasized in the rapid advance of these qualities, present prices today in Bradford for a super 60's top being 51c., 46's top 27c. to 28c., and 40's 20c. to 21c.

The cotton trade of Lancashire seems today to be completely under the thumb of a "bull" clique, and American cotton is being gambled with in a most alarming way. I see this week that futures for July and August have touched 5.56d., a price altogether unreasonable in view of the estimated crop for the past season. Cotton markets seem today to be completely ruled by Liverpool and New York speculators, the poor manufacturer and spinner faring very badly.

There is again renewed talk of spinners and manufacturers running short time to counteract some of the gambling tactics of speculators. By reducing consumption we have the only way of dealing effectively with unreasonable prices until the production of raw cotton becomes larger. Naturally spinners are buying as little as ever they possibly can, preferring to use what they have out of hand rather than buy at today's rates. These high prices are simply stopping orders from the Far East, while the home trade is being crippled and orders held back as much as possible. Users seem to have made up their minds to work from hand to mouth until a policy has been clearly defined.

A strike is threatened at Hyde in connection with the instalment by Messrs. Ashton Brothers of the Northrop looms, the weavers having resolved to come out unless better conditions are given them.

The Scotch woolen trade is an average one, and the same can be said of the Leicester hosiery trade.

TRADE WITH THE PHILIPPINES.

The exports of cotton goods from the United States to the Philippines last October showed some improvement over preceding months, but were relatively insignificant, being but six and three-tenths per cent. of the goods imported from all countries. The following table gives the share of each of the principal countries in this trade:

Great Britain	51 per cent.
Spain	16.2 per cent.
Germany	10 per cent.
United States	6.3 per cent.
British E. I.	4.5 per cent.
Switzerland	3.8 per cent.
China	1.2 per cent.
France	1.1 per cent.
Belgium	.3 per cent.
Other countries	5.6 per cent.

American Cotton Manufacturers' Association.

SEVENTH ANNUAL MEETING OF THE SOUTHERN COTTON SPINNERS AT CHARLOTTE, N. C.

The recent annual meeting of the above named association at Charlotte, N. C., was a success in every respect and among the noteworthy events was the adoption of a new name—The American Cotton Manufacturers' Association. This brings the name into harmony with the work and objects of the association and doubtless marks a new era in its career.

The sessions were held at Mecklenberg Court House on May 14 and 15 and on Friday evening closed with a banquet at the Central House. A large number were in attendance on Thursday morning when the president of the association, George B. Hiss, called the convention to order. An interesting incident was the presentation to the association of a gavel made from a rafter of the first cotton mill built in the South. This mill was built in 1811 on Upton Creek, nine miles from Washington, Wilkes Co., Ga. It was operated until 1842 and marks the beginning of the cotton industry in the South which has now grown to such proportions as to threaten the supremacy of Northern and foreign mills.

T. C. Guthrie, of Charlotte, welcomed the association to the city in an address in which he called attention to the rapid development of the South and the great promise which the future held out. The chairman of the Board of Governors, W. C. Heath, responded to the address of welcome. He said in part:

Our return here for this, the seventh annual meeting, for the fifth time, would indicate that we are much pleased with our former visits and that we have not forgotten or failed to appreciate the royal receptions that have heretofore been tendered. There is, therefore, a bond of union between your city and our association, and many of us feel that we are in the home of our own nativity; indeed, I might say, that we are on such friendly relations that we would, if necessary, visit you through the back doors, and when it does not suit our convenience to hold our conventions elsewhere we come to you without a formal invitation, knowing that we are always welcomed here—a city closely identified with the cotton milling industry of the entire South—a city in which the plans and specifications of two-thirds of our mills have been made, and from which we draw largely for our machinery, supplies and repairs.

The president of the association then delivered his address, of which the following is an abstract:

Gentlemen of the Convention: It is with a great deal of pleasure I welcome you to this, our seventh annual meeting. From the few members who organized the Southern Cotton Spinners' Association in this city, in the spring of '97, we have grown until today our membership is over three hundred. Originally our membership was confined largely to the state of North Carolina, while today we have enrolled as members, progressive manufacturers and business representatives, who claim citizenship in the various states from Maine to Texas. Thus have we advanced in the short space of six years from a local organization of manufacturers to one which has obliterated (manufacturingly speaking) the "Mason and Dixon Line." Our New England membership blends so pleasantly with our Southern membership that, collectively, the members of our association fail to recognize any North, South, East or West; therefore our association is, in point of character, national.

Among the important matters to which your attention is called is that of changing the name of our association in order that our work may be broadened in scope, and deprived of every appearance of sectionalism, it has been suggested that the name of our association be changed by substituting the word "American" for the word "Southern," and by substituting the word "Manufacturers" for the word "Spinners."

During the past two years manufacturers using American-grown cotton have failed to secure a proper margin of profit, and it has been during these last two years that "cotton manipulators" have held their greatest sway. It is estimated that between eighty and one hundred million bales of cotton are bought and sold annually in this country, while we actually produce an average of about ten million bales annually.

Is it not probable that these "cotton market manipulators" have an unfavorable bearing on the profits of the manufacturer in this country using American-grown cotton?

Excepting a few special fabrics, the prices the "manipulator" has fixed for cotton today is out of all proportion to the price the manufacturer can realize for his product. Is there not a remedy for this situation? If the cotton manufacturer could arrange to buy his year's supply of raw stock by making his purchase during the period covered from September 1 to December 1 of each year (as is largely the case with our foreign competitor), there would be but slight opportunity for the "cotton market manipulator" to juggle a profit out of the few hundred thousand bales not taken up by these purchases.

Gen. Wm. F. Draper, of Hopedale, Mass., read a paper on "The Development of Rap-

idly Running or Yielding Bearing Spindles." Gen. Draper was followed by Edward Atkinson of the Boston Manufacturers' Mutual Fire Insurance Company, who read a carefully prepared paper on "Mutual Fire Protection."

The convention resumed its sessions on Thursday afternoon. E. W. Thomas was to have read a paper, but in his absence Edward Atkinson of Boston volunteered to fill the gap and read a paper on "Sheep Upon the Upland Fields." He advocated more scientific methods of sheep raising, which he claimed would result in a great development of this industry in the South. B. W. Hunt, president of the Middle Georgia Cotton Mills, Eatonton, Ga., replied to Mr. Atkinson and gave his experience in sheep raising in the South. He did not take the rosy view of the business that was held by Mr. Atkinson. Among other things he said:

In my own case I have bought the experience, and I am truly a graduate of that school. In the beginning I lost several thousand dollars' worth of registered cattle in a few weeks, all dying of cattle fever. Now this disease is understood and known to be wholly dependent upon the cattle tick. Indeed, I was the first man knowingly to immunize cattle to this disease. This one disease was sufficient to keep the South from ever taking a leading position as a cattle breeding country. Even now the tick must be exterminated before the southern cattle breeders can be great factors in American beef production.

Mr. Hunt's remarks were followed by the reading of a paper on the electric drive in cotton mills by T. W. Bolen of the General Electric Company.

On Friday morning H. J. Webber of the United States Department of Agriculture gave an interesting talk on the breeding and cultivation of better cotton fibres. E. W. Thomas of Charlotte then read a paper on "The Advantages of Diversifying Manufactures in the South," in which he strongly advocated the policy of improving the grade of the goods manufactured in the Southern states.

At the business meeting Friday afternoon the Committee on Ways and Means submitted the following resolutions, which were adopted:

"Resolved, That the name of the association be changed by substituting the word 'American' for the word 'Southern,' and the word 'Manufacturers' for the word 'Spinners,' thus making the name The American Cotton Manufacturers' Association instead of The Southern Cotton Spinners' Association."

Resolved, That The American Cotton Manufacturers' Association be incorporated under the laws of the State of North Carolina. The chair appointed the following committee of five members of the Board of Governors to take the necessary steps to incorporate the association: W. C. Heath, chairman; E. W. Thomas, A. H. Lowe, R. S. Reinhardt and E. Lang.

Resolved, That article 2, section 2, of the constitution, which reads as follows: "To assist in eliminating the evils of the cotton manufacturing interest both in relation of mills to each other and the commission houses with which they deal," be changed so as to read, "To assist in the diffusion of information and in broadening our knowledge of our possibilities of successful and profitable cotton manufacturing."

A special committee appointed to consider the plan of curtailing production submitted the following resolutions, which were adopted:

"Your committee having duly considered the important subject referred to them, now beg to submit to your consideration the following resolution:

"'The cotton manufacturing world using American short staple cotton is facing conditions that are likely to continue so long as present artificial influences dominate the market for the raw material, and these conditions are so serious that action by the Southern Cotton Spinners' Association is deemed imperative ,and your committee to whom this subject has been referred, would recommend that the whole influence of the association be used to:

"'1st. To bring about an entire cessation of night work.

"'2d. Operation of mills not over four days per week.

"'3d. These recommendations to take effect not later than June 1 to 15, 1903.'

"Your committee is of the opinion that by a proper effort the co-operation of the majority of the mills in the Southern states can be secured and believe that an appeal should also be sent out to banks, as well as commission houses to throw their influence in the same direction. If favorable action is taken by the convention your committee recommend that the American consul at Manchester be cabled to communicate this action to Liverpool and Manchester exchanges."

Following is a list of the new officers elected:

President, W. C. Heath of Monroe; vice-president, Thomas M. Swift of Elberton, Ga.; secretary and treasurer, C. B. Bryant, Charlotte.

Board of Governors: R. S. Reinhardt, Lincoln, chairman; Dr. J. H. McAden, Charlotte; Arthur H. Lowe, Fitchburg, Mass.; J. C. Smith, Newton; Geo. B. Hiss, Charlotte; R. R. Ray, McAdenville; E. W. Thomas, Charlotte; A. P. Rhyne, Mt. Holly; E. Lang, West Point, Ga.; David Clark, Charlotte; Val Taylor, Uniontown, Ga.; J. P. Leak, Rocking-

ham; E. A. Smith, Charlotte; T. L. Wainwright, Stonewall, Miss.; B. E. Willingham, Macon, Ga.

An indication of the broadened scope of the association is to be found in the election of a Northern man, Arthur H. Lowe, of the Parkhill Manufacturing Company of Fitchburg, Mass., as a member of the Board of Governors and executive committee. The retiring president, George B. Hiss, was complimented on all sides for the phenomenal success of the association during his administration.

The members of the association are to be congratulated upon the success of this session which marks the inauguration of The American Cotton Manufacturers' Association. Among those to whom special credit is due are George B. Hiss, the retiring president, C. B. Bryant, secretary and treasurer, also R. S. Reinhardt and E. W. Thomas and the members of the Board of Governors, who were indefatigable in their efforts to give the visitors, especially those from the North, a truly Southern welcome.

ADVERTISING TEXTILE FABRICS. WILL IT PAY?

II.

COST OF ADVERTISING.

Assuming that a textile manufacturer has decided to advertise his product to the consumer, the first question in his mind will be "What does it cost?"

This interrogation in categorical form has frequently been put to the writer by business men who ask for the price of an advertising campaign as they might call for quotations on a bale of cotton. I have always refused to make a guess of even the most tentative sort in answer to any such generic question.

A sadly large number of otherwise hard-headed business men learn from somewhere "what it costs to advertise." Years of perhaps undue conservatism are undermined by the success of advertising competitors, or by the kindergarten stories of fortunes built out of appropriations of $50 or $100; and the hard-headed business man rushes in where angels fear to tread. The initial efforts may bring results and they may not; the money may come back quickly or it may go still more quickly. A slight success that leads to a fortune, or discouragement ending in early failure, lie equally close at hand. This is the sort of financing that has made advertising a by-word for a lottery. Furthermore, it has led to the belief that advertising money is thrown away unless fortunes are first invested—a notion just as extreme as that of the optimists who expect to get rich by spending $50 in a mail order paper.

CHIEF CAUSES OF FAILURE.

It has been said that 70 to 75 per cent. of all advertisers drop out before the end of their first year. As a rule, this may be traced to one or more of three causes:

1. Weak advertising copy, or defective literature for following up prospective customers, or both.

2. Methods of merchandising that do not harmonize with the advertising campaign.

3. Lack of capital to push the enterprise through on the lines originally attempted.

Only in the rarest instances does a fourth cause operate, viz., that the particular article to be sold is not advertisable. This, in the writer's judgment, is the case only when the article in question can have but an extremely limited sale or when a mail order proposition has been "drummed to death." The chief cause of failures is by common consent the lack of capital. As already indicated this does not necessarily mean that anything like the vast sums must be invested that are popularly supposed. What is does mean is that many shrewd business men who are new in the advertising field begin on a scale of monthly expenditure which seems conservative at first, but becomes a burden on the long run. The many incidental expenses of advertising are extremely heavy; it takes much time to realize on the money invested, and all the while, through various causes, the original monthly appropriation keeps growing.

Sometimes an advertisement through lucky circumstances brings very quick results, and this is one of the greatest dangers. A man who might have been able to spend $5,000 in a year sees his first expenditure of $500 coming back to him in a few weeks with 100 per cent. profit. He then increases

his advertising out of all proportion to his capital and expects similar returns to continue. However, the lucky circumstances that enriched him the first time may have passed away—the season may not be as propitious, a competitor may have entered the field with better inducements or there may be reasons beyond analysis, at any rate, the big results fail to come. But the advertising has been entered upon on a large scale and unless there is to be a vast loss, it must be continued. Undoubtedly there will be some returns, but they will not be sufficient to cover the expenses. After a few months the advertiser either drops out or changes tactics to cheaper methods of advertising, and gradually disappears from the pages of the magazines altogether. This very experience was had in Chicago recently by one manufacturer of a textile specialty, who however did not stop in time. He changed his advertising policy a half dozen times in two years and ended in bankruptcy.

TIME WILL BRING SUCCESS.

In laying out advertising appropriations the element of time is all important. Every business man knows that it takes time to build up a business. Trade may begin on the smallest proportions and years of effort may build up a gigantic business, while a firm, operating with huge capital, can hardly expect to realize a profit from the start. The same holds true to even a greater degree in advertising. It takes time to organize a factory or a selling force and it takes even longer time to impress upon the public through the medium of cold type the fact of your existence. A year is perhaps a short period to expect tangible results on publicity business, and even the quickest mail-order propositions rarely begin to pay in less than three months.

Another source of delay enhancing the first cost of advertising is that there is necessarily a certain period of experimenting. Errors are sure to be found and money will have been lost somewhere. Attractive advertisements will appear valueless, or at least subject to revision; publications which the best posted advertising counsel may have selected, will be found inadequate for the particular proposition in hand, and in many respects the firm's system of merchandising will require re-adjustment. All this takes time and meanwhile the advertising expenditures continue.

Beware of the advertising agent who comes with his statistics, his a priori theories and his mouthful of "advertising science" to relieve the business world of such experiments! Each particular case creates its own problems and the advertising field itself is of such complexity and perplexity that the best posted advertising contractor today concedes the difficulty and makes himself valuable, not in laying out some hard and fast advertising campaign that sprang Minerva-like from the inner recesses of his brain, but in assisting the merchant by devising and directing plans that work themselves out in their operation.

GAMBLING ELEMENT REMOVED.

In fact it is exactly the experimenting in detail that elevates an advertising campaign as a whole above the level of an experiment. Judiciously begun the advertising will bring some results soon, and bigger results with real profits later, as one by one, the best methods, the best kind of copy and the best mediums for each particular case are discovered. If this view be right, the merchant or manufacturer figuring the cost of advertising could proceed in either one of two ways:

He could start with a first month's expenditure of much less than one twelfth of the total first year's appropriation, and gradually increase along the lines that have paid him best; or

He could take for the first month or two considerably more than the proportionate share designed for this period and begin by testing different mediums and varying copy. Later he could sift down to the best paying propositions.

The former is the method, when there is any method, of the average conservative advertiser. The other scheme has the advantage of leading to definite profits earlier. But the merchant choosing to start in this way should hold to the determination to reduce his appropriation in later months to a sum within easy limits of his capital. Even if all

the schemes tried at the outset should have proven profitable, only the best ones should be continued unless the resources of the house permit an extension of the advertising appropriation beyond that originally laid out.

INCIDENTAL EXPENSES HEAVY.

Finally as to the cost of advertising, the best financed firms allow for a wide margin of expense above the actual cost of the newspaper space itself. To show how one large manufacturer of ladies' dress goods began advertising on a combination of mail order and publicity business, I submit below a table prepared, as I believe in good faith, on his statement of actual figures:

Additional office help	$1,500
Literature	750
Postage on literature and on follow-up letters	500
Samples	1,800
Postage on samples	275
Balance for advertising	5,175
Total	$10,000

The sum appropriated for advertising space was barely one-half of the total. Cost of samples was exceptionally heavy and the extra postage merely to carry samples was unusual. The idea of this manufacturer, as he himself expressed it, was that the samples and literature were more than half the ammunition. He would not stint himself on these, he said, even if he had to reduce still further the sum allowed for magazine space. Of course the itemized statement was only in the rough, as no one could know in advance how many samples and how much literature would be sent out in response to the advertisements. I do not know the exact figures as to the amounts actually spent that year, but the appropriation, I am told, came close to it.

It will be seen from the above that if this firm had laid out its appropriation for advertising space at the rate of, say, $800 a month or $10,000 a year, they would have been obliged to spend at least twenty-two or twenty-three thousand dollars in order thoroughly to cover all the incidentals that would make the advertising space really valuable. The chances are that an advertiser starting out in this way with expenses growing so quickly and returns delayed, would get disheartened, try to economize on the unexpected incidentals and eventually lose money on his campaign.

Ten thousand dollars a year is a fair average. Those that spend as much or more are generally classed by advertising agencies as fairly large advertisers, and those spending less are recognized as small advertisers. As a general thing the amount of money supposed to be spent by large houses in advertising is greatly exaggerated. One dress

Corticelli
SPOOL SILK
When you go shopping don't simply say "A spool of silk," because you can secure more silk, better silk, brighter silk, smoother silk, and stronger silk if you will only ask for "Corticelli." We make the best silk for sewing and machine stitching, as well as for Art Needlework, Purses, Chatelaine Bags, Mountmellick Embroidery, etc. Write us what you want. Beautiful Fall Fashion Booklet mailed free.
Corticelli Silk Mills, 52 Nonotuck St., Florence, Mass.
TOO STRONG TO BREAK

FIG. 1.

goods concern was said to be spending $100,000 a year, but upon checking up their advertising in the magazines it seemed that

their appropriation did not exceed $10,000 or possibly $15,000.

STATISTICS OF TEXTILE MILLS.

In the textile industry the expenditures are disproportionately small. The daily papers which eat up $50,000 or $100,000 very easily on a national campaign are hardly ever used by textile mills, the only advertisers in these

No More Darning
Racine Feet
A New Pair Hose for 10c.
Cut off ragged feet attach "Racine Feet" to legs of hosiery by our new Stockinette Stitch, and you have a pair of hose as good as new. Cost only 10c. and a few moments' time.
Racine Feet come in cotton, sizes 5 to 11, black or white. Price 10c. a pair; prepaid.
Booklet, "The Stockinette Stitch," tells everything.
Sent free. Agents wanted.
Racine Knitting Co.
Dept. C, Racine, Wis.

FIG. 2.

mediums which occur to the writer just now being Dr. Jaeger's underwear, Dr. Deimel's underwear and Fleischer's yarn. In the magazines very few use large copy. There is one silk mill with the distinction of being almost the only really large advertiser in the magazines, and with the result that the Nonotuck Silk Company has made its pretty pussy famous and the name Corticelli perhaps more nearly a household word than any other textile product. (Fig. 1.) The Racine Knitting mills, whose small but telling advertisements of Racine feet (Fig. 2) have become thoroughly familiar, have just begun with large copy, but unfortunately on a mail order scheme which has seen its best days. A few others like Shawknit and the Lewis union suits are advertised by page copy. None of these mills, however, spend anything approximating the sums invested by corset manufacturers, soap houses or the food product people. The annual appropriations of some of these run from $400,000 to $500,000, conservatively at least a quarter of a million dollars a year.

The usual space used in magazines by textile mills is three or four inches such as "Lovely Lansdowne" of the Victoria Mills, Ypsilanti Health Underwear, etc. Fifty-six lines, single column, that is, four inch space, is a fair quantum, but there are so few even of these advertisers in the textile line that the total will make but a very tiny percentage of the $300,000,000 said to have been invested in advertising last year in the United States. This is shown by such publications as the Ladies' Home Journal and the Woman's Home Companion which ought certainly to carry a large proportion of textile mill business. Upon looking over a recent copy of the former we find a total of textile advertising as follows:

Silks	3	columns
Dress goods	2½	columns
Underwear and hosiery	1¾	columns
Yarns	¼	column
Total	7½	columns

Compare this with the total for one finished dress article alone, viz., corsets, of 8 1/4 columns, or the following:

Household furniture	12¾	col.
Soaps	12½	col.
Food products	16½	col.

Considering that everybody wears hosiery and comparatively few persons are addicted to predigested breakfast foods, a grand total of 1 3/4 columns for underwear and hosiery as against 16 3/4 columns for food products seems odd.

Magazines like the Review of Reviews and McClure's show similar figures. A recent issue of the Review of Reviews, for instance, has advertising space divided as follows:

Railroads	11	pages
Automobiles and carriages	13½	pages
Ready made clothes	5½	pages
Food products	9	pages
Publishers' announcements	32	pages
Hosiery	1	page

NEED NOT SPEND A FORTUNE.

From these and similar figures it would seem that a textile manufacturer need not spend anywhere nearly as large a sum to force attention to his wares as would a maker of corsets. A four-inch advertisement of a corset would be lost next to a page advertisement of the Kabo or American Lady corset, but the 56-line advertisements of S. H. & M. skirt binding have been seen and read by this time, we may presume, by every reading woman in the land.

E. T. GUNDLACH.
115 Dearborn St., Chicago, Ill.

(To be continued.)

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

CORKSCREW WEAVES; THEIR CONSTRUCTION AND APPLICATION TO WORSTED TROUSERINGS, COATINGS AND SUITINGS.

Corkscrew weaves are what we may call double twills or better yet oblique warp effect rib weaves, and similar to the latter system of weaves require, as a rule, a high warp texture, especially when dealing with *pure* corkscrews and where the warp forms both the face and back of the fabric, the filling resting in this instance imbedded between said warp threads, being neither visible on face nor back of the structure. Certainly with reference to *derivative* corkscrews this affair is more or less modified, the filling in some instances playing a most important part in the character, construction, as well as pattern of the fabric. In some few instances again, pure corkscrews—like for example our 5 harness corkscrew weave—(used $\frac{2}{3}$ in order to give the filling a chance to show more prominently on the face of the fabric) are used in connection with a low texture in the construction of fancy worsted suitings (both in plain colors as well as mixes), said corkscrew in this instance closely resembling a granite weave on account of the filling showing through between the thus open twill line effect of the fabric. Corkscrew weaves may be divided into pure or common and fancy effects.

CONSTRUCTION OF PURE CORKSCREWS.

The same are obtained from our regular or 45° twills by means double, *i.e.*, satin draws. The lowest number of harness to construct a corkscrew for is 5 harness, after which they can be designed for any number of harness as the case may require. We will now describe the construction of a few of the most prominent weaves of this kind, a close study of which will readily demonstrate to the student that an endless variety of this class of weaves can be designed. Pure corkscrew weaves are best designed, or suited, for an uneven number of harness for their repeat, since in this instance only a uniform connection on either side of the double twill can be made, *i.e.*, the cut lines between the twills are uniform, a feature not possible to do if dealing with a corkscrew weave having an even number of harness for their repeat.

CORKSCREWS CONSTRUCTED FOR AN UNEVEN NUMBER OF HARNESS REPEAT.

Of the accompanying diagrams of corkscrew weaves:

Fig. 1 shows the common 5 harness corkscrew weave, repeat 5 × 5, and which it derived from the regular $\frac{3}{2}$ 5 harness 45° twill by means of its satin draw: *1*, 4, *2*, 5, *3*, 1, *4*, 2, *5*, 3, as clearly shown by the two kinds of type used in diagram of weave and of which either kind of type—considered by itself, side by side—shows the $\frac{3}{2}$ 5 harness foundation twill previously referred to.

Fig. 2 shows the regular 7 harness corkscrew weave, repeat 7 × 7, and which is derived from the common $\frac{4}{3}$ 7 harness 45° twill by means of its satin draw: *1*, 5, *2*, 6, *3*, 7, *4*, 1, *5*, 2, *6*, 3, *7*, 4, as again clearly shown by the two kinds of type used in our diagram of the weave and of which, considering each type ■ or ⊡ by itself, either one type clearly shows the foundation twill.

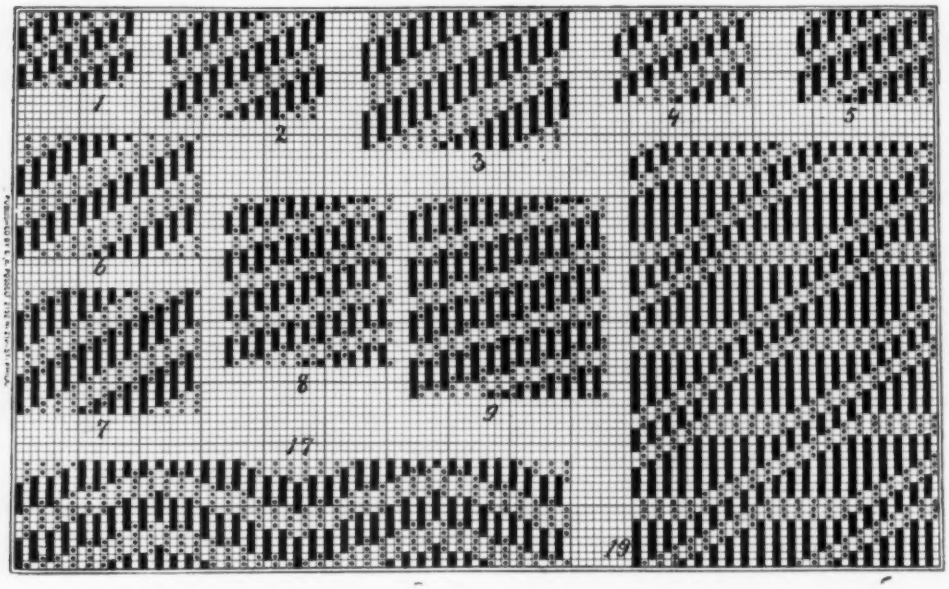
In the same manner as thus far described, diagram Fig. 3 shows the common 9 harness corkscrew weave, repeat 9 × 9 and which in turn is derived from the regular $\frac{5}{4}$ 9 harness 45° twill by means of its satin draw *1*, 6, *2*, 7, *3*, 8, *4*, 9, *5*, 1, *6*, 2, *7*, 3, *8*, 4, *9*, 5; either kind of type as used in the diagram, if considered by itself showing the foundation twill previously referred to. Similar to the three common corkscrews thus shown respectively for 5, 7 and 9 harness, we can construct them for 11 or more

harness; however, 9 will be about the limit of these weaves for practical work, for 11 and 13 harness a different construction of a corkscrew being used and which two weaves in turn later will be dealt with.

Examining weaves figs. 1, 2 and 3 closely at the points where the two twill lines meet *i.e.*, the warp threads exchange from face to back of structure and vice versa, we readily see the uniform "cut off" or equal overlapping of warp threads in their exchange from risers to sinkers and vice versa as previously referred to. This feature as already mentioned is only possible

CORKSCREWS CONSTRUCTED FOR AN EVEN NUMBER OF HARNESS REPEAT, FROM ONE 45° TWILL.

Fig. 4 shows the six harness corkscrew as is obtained in turn from the $\frac{2}{3}$ 6 harness twill by means of satin draw *1*, 4, *2*, 5, *3*, 6, *4*, 1, *5*, 2, *6*, 3. In this instance we will readily see that in one instance the two warp floats overlap each other as is the case in the previously explained three examples of corkscrews designed for an uneven number of harness for the repeat of the weave, whereas in the other instance we see that warp floats do not overlap, giving at



when dealing with corkscrews designed for an uneven number of harness for their repeat and for which reason 5, 7, 9 (and 11 and 13 harness as will be explained later on) harness corkscrews are *the* weaves more particular used in the manufacture of corkscrew fabrics executed either in plain colors, piece dyed or staple mixtures and where a uniform "cut off" of the twill lines is an essential feature for a salable face. As we will see from diagrams Figs. 4, 5, 6 and 7, this equally cutting off of the twill lines is not possible when dealing with a corkscrew designed from one 45° twill of an even number of harness repeat, and where every alternate cut off line only will be uniform in effect.

their point of meeting, the filling a slight chance to show (over two warp threads) on the face of the fabric. Repeat of this corkscrew is 12 × 6.

Fig. 5 shows the 6 harness corkscrew weave obtained from the $\frac{4}{5}$ 6 harness 45° twill by means of the same draw as used in the previously given example. In this example one of the cut-offs of the twill corresponds again to those as used in connection with the uneven harness corkscrews (figs. 1, 2 and 3) whereas for the other cut-off the two warp threads previously to their exchange from face to back and vice versa overlap each other for two successive picks producing in turn a less prominent cut-off line than in the other instance. No filling (as compared to the former 6 harness corkscrew)

will in this instance have a chance to show on the face of the cloth, that is, provided a sufficiently high warp texture is used in the construction of the fabric. Repeat of weave 12 × 6.

Fig. 6 shows the 8 harness corkscrew designed from the $\frac{4}{4}$ 8 harness 45° twill and which corkscrew is identical in its construction and cut-off effects to the 6 harness corkscrew shown in diagram fig. 4. Considering respectively either all the even or uneven number of warp threads by itself (either ■ or ⊡ type) will readily show the foundation twill. Repeat of corkscrew 16 × 8.

lection of texture can hardly be surpassed by any other weave. The cut-off line in these structures is, besides being uniform, of a milder character to those in corkscrews of regular construction. Keeping the warp in the present instance more on the face of the structure will certainly in turn throw more of the filling to the back.

Fig. 8 shows the 11 harness corkscrew in turn obtained from the $\frac{4}{2}\frac{3}{2}$ 11 harness 45° twill by means of its satin draw thus: 1, 4, 7, 10, 2, 5, 8, 11, 3, 6 and 9. The two kinds of type in diagram are not given for the purpose of simplifying construction of weave to the

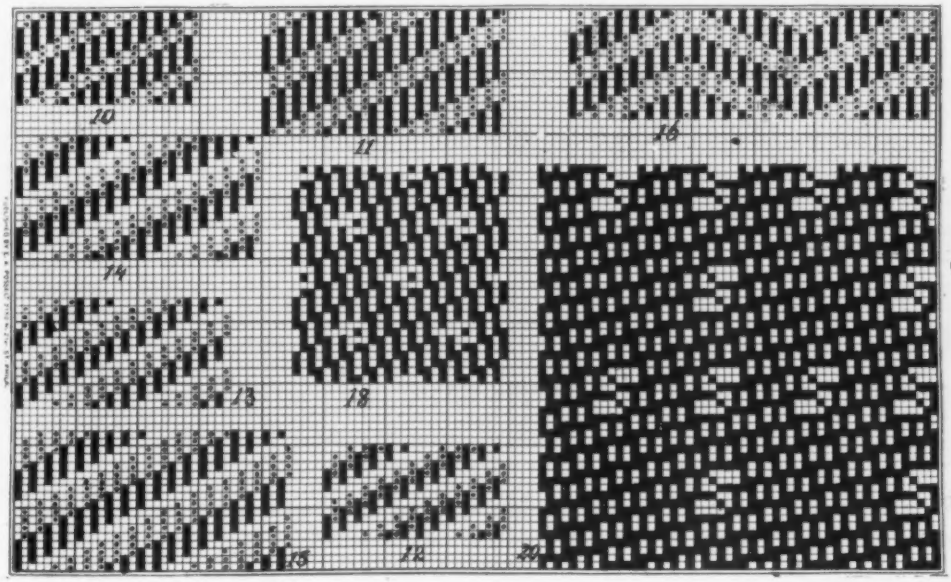


Fig. 7 shows the 8 harness corkscrew designed from the $\frac{5}{3}$ 8 harness 45° twill and which corkscrew in its construction and cut-off effects is identical to the 6 harness corkscrew shown in diagram Fig. 5. Repeat of weave 16 × 8.

THE 11 AND 13 HARNESS CORKSCREW

are standard weaves for piece dyed worsteds, being at the same time also frequently used in connection with wool dyed structures both in plain colors and mixtures. Both weaves on account of their full face (prominent float of warp on face of fabric to that on back of structure) produce excellent fabrics and with a proper student (for which consult draft previously quoted) but for the object in view to show cut-off effect of the warp threads. Repeat of the weave 11 × 11.

Fig. 9 shows the 13 harness corkscrew as is obtained from the $\frac{5}{2}\frac{4}{2}$ 13 harness 45° twill by means of its satin draw 1, 5, 9, 13, 4, 8, 12, 3, 7, 11, 2, 6, 10 or take one and skip three, and which draw will readily explain the construction of the corkscrew, the two kinds of type being used for the purpose to show more clearly the cut-off effect of the warp threads in their exchange from risers to sinkers and vice versa. Repeat of weave 13 × 13.

CORKSCREWS CONSTRUCTED FOR AN EVEN NUMBER OF HARNESS REPEAT, FROM TWO 45° TWILLS.

When combining two regular twills of an even number of harness repeat into a corkscrew, the disadvantage of the difference in the cut-off lines of the twills as mentioned in connection with weaves Figs. 4 to 7 is omitted, however, a higher number of harness, for the corkscrew twill thus constructed, will be required; again the size of the twills in the corkscrew will vary according to combination of foundation twills selected. Weaves for the present division of corkscrews are shown by means of Figs. 10 and 11.

Fig. 10 shows the combination of the $\frac{1}{2}$ and $\frac{1}{3}$ 6 harness twills, drafted alternately one end from the $\frac{1}{2}$ (see ■ type) and one end from the $\frac{1}{3}$ (see ⊡ type) twill. Repeat of the corkscrew weave 12 × 6.

Fig. 11 shows the combination of the $\frac{2}{3}$ and $\frac{1}{4}$ 8 harness twills, drafted alternately one end from the $\frac{2}{3}$ (see ■ type) and one end from the $\frac{1}{4}$ (see ⊡ type) twill. Repeat of the corkscrew weave 16 × 8.

CORKSCREWS SHOWING FILLING TWILLS.

This sub-division of our corkscrew weaves is readily explained by means of diagrams Figs. 12 to 15. The foundation of this division of corkscrews are our regular or 45° twills.

Fig. 12 shows such a corkscrew as derived from the $\frac{2}{3}$ 6 harness 45° twill drafted thus: 1, 3, 2, 4, 3, 5, 4, 6, 5, 1, 6, 2. Repeat of weave 12 × 6. The size of the filling effect twill in this weave is "over 4 warp threads."

Fig. 13 shows a corkscrew derived from the $\frac{3}{4}$ 7 harness 45° twill drafted thus: 1, 4, 2, 5, 3, 6, 4, 7, 5, 1, 6, 2, 7, 3. Repeat of weave 14 × 7. Size of filling effect twill "over 4 warp threads."

Fig. 14 represents a corkscrew obtained in turn from the $\frac{1}{4}$ 8 harness 45° twill drafted thus: 1, 4, 2, 5, 3, 6, 4, 7, 5, 8, 6, 1, 7, 2, 8, 3. Repeat of weave 16 × 8. Size of filling effect twill "over 4 warp threads."

Fig. 15 is the corkscrew derived from the $\frac{1}{5}$ 9 harness 45° twill drafted thus: 1, 5, 2, 6, 3, 7, 4, 8, 5, 9, 6, 1, 7, 2, 8, 3, 9, 4. Repeat of weave 18 × 9. Size of filling effect twill "over 4 warp threads."

CURVED CORKSCREWS.

This subdivision of corkscrews is derived from the regular or 45° twills by drafting the latter by means of satin draws alternately from left to right and right to left, continuing in this manner until a repeat of the weave is obtained. Weaves Figs. 15 and 16 are designed in this manner.

Fig. 16 shows such a curved corkscrew derived from the $\frac{1}{3}$ 7 harness 45° twill by means of drafting thus: 1, 5, 2, 6, 3, 7, 4, 1, 5, 2, 6, 3, 7, 4, 1, 5 (left to right), 1, 4, 7, 3, 6, 2, 5, 1, 4, 7, 3, 6, 2, 5 (right to left). Repeat of weave 30 × 7; to be woven on 7 harness by means of the following drawing-in draft: 1, 2, 3, 4, 5, 6, 7, 1, 2, 3, 4, 5, 6, 7, 1, 2, 1, 7, 6, 5, 4, 3, 2, 1, 7, 6, 5, 4, 3, 2; or for 14 harness use 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 1, 2, 1, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2.

Fig. 17 shows a curved corkscrew, drafted more flat as compared to the preceding weave, a feature obtained by drafting for each twill effect every other warp thread twice. The foundation for the present weave is the $\frac{1}{3}$ 7 harness 45° twill drafted thus for the corkscrew: 1, 5, *2*, 6, *2*, *6*, 3, 7, 4, 1, *4*, *1*, 5, *2*, 6, 3, *6*, *3*, 7, *3*, 6, *3*, *6*, 2, 5, 1, 4, *1*, *4*, 7, 3, 6, 2, *6*, *2*, 5. The italic numbers show the additional drawing on a harness as drawn once before in order to give in this instance to the corkscrew twill the flat effect desired. Draft thus quoted is in this instance the drawing-in draft required to weave the present corkscrew in connection with 7 harness, using the foundation twill = the $\frac{1}{3}$ 7 harness 45° twill—for harness chain.

SPOTTING WITH FILLING

upon the face of corkscrews is the next step for producing fancy effects; the affair being readily explained by means of one example, viz.: Fig. 18, showing filling spotting, arranged after the "plain motive," upon a 7 harness regular corkscrew weave (see Fig. 2). Repeat of the new weave (2 changes in plain motive × 7 repeat of corkscrew) 14 warp threads × 14 picks.

FIGURED CORKSCREWS.

In this division of corkscrew weaves figures of any size or form are produced by arranging a corresponding floating of alternate warp threads. Every even-numbered warp thread (for example) being used for producing either figure or ground effect, vice versa every uneven-numbered warp thread being used for producing the reverse effect. Weave Fig. 19 is an example of such a figured corkscrew weave, ■ showing one effect, vice versa · type as showing the other. Repeat of the weave 20 harness × 55 picks.

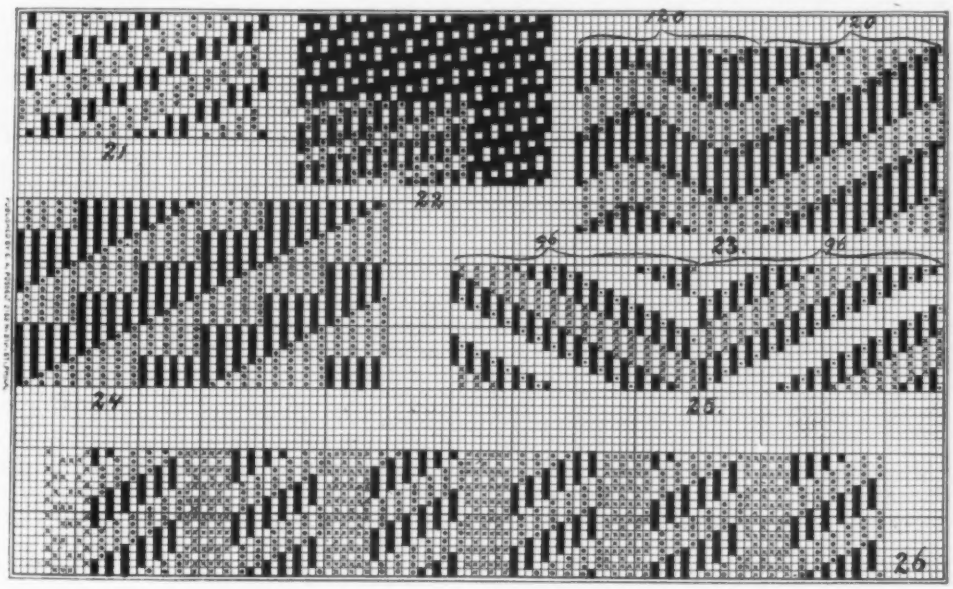
WORSTED SUITING.

Repeat of weave 26 × 26. Texture as used with the fabric under consideration is thus: —

Warp:—6,336 ends, 2/50's worsted, 26-harness straight, or 17-harness fancy drawing-in draft.
Reed:—16 × 6 = 66 inches wide in loom.
Filling:—105 picks per inch, all single 20's worsted.
Finish:—Worsted finish; 56 inches wide.

Weave Fig. 21 shows a figured corkscrew with filling effect. Repeat 16 × 8.

⊡ shows a regular twill line working $\frac{2}{5}$, whereas ■ shows the figured effect $\frac{2}{5}$ working for two threads alike and then rising for two



Having thus given a thorough explanation of corkscrew weaves, we next will give

THEIR PRACTICAL APPLICATION—MORE PARTICULARLY IN FANCY EFFECTS—TO WOVEN FABRICS,

quoting in turn complete construction of the respective structures which in turn comprise some of the latest novelties in worsteds, in fancy trouserings and suitings, as well as piece dyes.

Weave Fig. 20 shows a spotted 13-harness corkscrew, as used in connection with a wool or piece-dyed

picks on the next warp thread, in turn forming right-angular-shaped filling-effect spots of "over 2 and over 4 warp threads" respectively. A good color combination and texture with reference to a

WORSTED TROUSERING

for this weave is thus: —

Warp:—8,320 ends; 16-harness straight draw.
Reed:—16½ × 8 = 63 inches wide.
Dress:—

7 ends, 2/52's worsted, dark	=	7 ends.
4 ends, 2/52's worsted, medium	=	4 ends.
8 ends, 2/52's worsted, dark	=	8 ends.
1 end, 2/52's worsted, light 1 end, 2/52's worsted, medium	× 2 =	4 ends.
1 end, 2/52's worsted, light	=	1 end.
Repeat of pattern:		24 ends.

Filling:—95 picks per inch, all plain, 2/52's worsted, dark.
Finish:—Worsted finish; 56 inches wide.

Weave Fig. 22 shows a variation (compared to weave Fig. 8) of an 11-harness corkscrew derived from the $\frac{4}{1}\frac{4}{2}$ 11-harness 45° twill by means of its satin draw 1, 5, 9, 2, 6, 10, 3, 7, 11, 4, 8. Repeat of weave 11 × 11. Similar to the 11 and 13-harness corkscrew shown respectively by means of weaves Figs. 8 and 9, the new weave thus shown is well adapted — on account of its full warp face — for plain wool and piece-dyed

WORSTED SUITINGS.

A good construction for such a fabric being:

Warp:—6,300 ends; 22-harness straight draw, 2/50's worsted.
Reed:—15 × 6 = 70 inches wide in loom.
Filling:—30 cut woolen yarn.
Finish:—Cloth finish; 10% take-up during fulling; 56 inches finished width.

Weave Fig. 23 shows a curved corkscrew, as obtained from the $\frac{2}{3}$ 12-harness 45° twill,— applied in texture and coloring to a

WORSTED TROUSERING,

thus:—

Warp:—7,488 ends; 24-harness fancy draw.
Reed:—19½ × 6 = 64 inches wide in the loom.
Dress:—

1 end, 2/50's worsted, light	× 48 = 96 ends.	
1 end, 2/50's worsted, dark		
1 end, 2/50's worsted, dark and light twist	× 2 = 4 ends.	
1 end, silk, 37,500 yards, per lb., lively shade, 2-ply used as one		
1 end, 2/50's worsted, light	× 14 = 28 ends.	
1 end, 2/50's worsted, dark		
8 ends, 2/50's worsted, dark and light twist		
1 end, 2/50's worsted, dark	× 4 = 8 ends,	× 3 = 72 ends.
1 end, 2/50's worsted, light		
1 end, 2/50's worsted, light	× 4 = 8 ends,	
1 end, 2/50's worsted, dark		
8 ends, 2/50's worsted, dark and light twist	= 8 ends.	
1 end, 2/50's worsted, dark	× 4 = 8 ends.	
1 end, 2/50's worsted, light		
1 end, 2/50's worsted, light	= 1 end.	
1 end, 2/50's worsted, dark	= 1 end.	
1 end, 2/50's worsted, dark and light twist, shade No. 2	× 2 = 4 ends.	
1 end, silk, 37,500 yards, per lb., lively shade, 2-ply used as one		
1 end, 2/50's worsted, light	= 1 end.	
1 end, 2/50's worsted, dark	= 1 end.	
8 ends, 2/50's worsted, dark and light	= 8 ends.	
1 end, 2/50's worsted, dark	× 4 = 8 ends.	
1 end, 2/50's worsted, light		
Repeat of pattern: 240 ends.		

Filling:—102 picks per inch, 2/60's worsted, light shade.
Finish:—Worsted finish; 56 inches finished width.

Weave Fig. 24 shows a figured corkscrew. Repeat 24 × 12, being a weave well suited for a

WOOL OR PIECE-DYED WORSTED SUITING,

a good construction for which is thus:

Warp:—7,296 ends, 2/58's worsted; 24-harness straight draw.
Reed:—19 × 6 = 64 inches wide in loom.
Filling:—135 picks per inch, single 32's worsted.
Finish:—Worsted finish; 56 inches wide.

Weave Fig. 25 shows a filling effect twill — broken corkscrew applied to a

FANCY WORSTED TROUSERING.

Repeat of weave 192 × 16. The effects produced in the new weave comprise two warp effect twill lines, shown by ■ type, carrying between it another warp-effect twill line, shown by × type; the latter warp threads being somewhat stitched, invisible on the face, to the fabric structure (in order to reduce their excessive float 12 down to 5 down) by means of risers shown by ⊡ type. The filling-effect twill, as produced in the fabric between the warp-effect twills previously referred to (see □ type), is "over 9-warp threads."

Warp:—7,488 ends, 24-harness fancy draw.
Reed:—19½ × 6 = 64 inches wide in loom.
Dress:—

1 end, 2/50's worsted, light	× 8 = 16 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 2 = 4 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, light	× 6 = 12 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 2 = 4 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, light	× 4 = 8 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 4 = 8 ends.
1 end, 2-ply silk @ 37,500 yards, lively	
1 end, 2/50's worsted, light	× 4 = 8 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 2 = 4 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, light	× 6 = 12 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 2 = 4 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, light	× 8 = 16 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 8 = 16 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, light	× 2 = 4 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, dark	× 6 = 12 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, light	× 2 = 4 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, light	× 4 = 8 ends.
1 end, 2-ply twisted silk, lively	
1 end, 2/50's worsted, dark	× 4 = 8 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, light	× 4 = 8 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, dark	× 2 = 4 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, light	× 6 = 12 ends.
1 end, 2/50's worsted, light	
1 end, 2/50's worsted, dark	× 2 = 4 ends.
1 end, 2/50's worsted, dark	
1 end, 2/50's worsted, light	× 8 = 16 ends.
Repeat of pattern: 192 ends.	

Filling:—88 picks per inch, arranged thus:
2 picks, 2/50's worsted, dark
2 picks, 2/50's worsted, light.
A different shade as compared to warp in either case.
Finish:—Worsted finish; 56 inches wide.

(To be continued.)

POINTS ON MIXING COTTON.

No thoughtful man can deny the importance of a proper system of mixing cottons in order to produce yarn of a required price as well as of uniform quality and color.

It is the most important of all the long and costly series of operations gone through in a spinning mill and has for its object to mix or mingle the different qualities of cotton so as to obtain a new quality, which shall be such an average of the qualities of each as may be required for the special kind of yarn ordered. This is really a work demanding the exercise of good judgment and consummate skill in handling and observing the variations of tint and shade which may diverge from the normal tone or color of the cotton desired.

Mixing can be done (a) in the "stack," i. e., before picking, (b) at the intermediate or finisher scutcher or (c) at the drawing frames. The first two are the most commonly used methods.

In a mixing room where a large number of bales are stored it is a good plan to compare the cottons in the different bales, as to their relative lengths of staple, color, cleanliness and cohesiveness.

To make up a stack or bing of cotton is a matter of the very first importance, and should never under any circumstances be left to careless hands, or to those who are ignorant as to the serious results of bad mixing.

When the number of bales to be used in the mixing has been decided upon and the space to be occupied, and when dealing with bales not too light, hard, pressed, the bales that are to be mixed should be brought forward one by one, opened, pulled into small pieces, and spread out equally over the whole surface of the bing, beginning at the bottom, and so on alternately, layer above layer, and trampled down.

When dealing with bales heavily compressed by means of which the cotton fibre is more or less matted in cakes, mixing is most satisfactorily accomplished with the aid of the bale breaker, or a special heavy built hopper feed, by spreading a small quantity from each of a number of bales—say ten—in turn upon the lattice of the bale breaker or in the box of the hopper feed or similarly constructed bale breaker. The fibre as it is delivered from either machine is most conveniently conveyed by traveling lattices about 24 in. wide to its own mixing. These lattices are driven by bevel gearing, preferably from the bale breaker or the hopper feed, i. e., whichever machine is used for this purpose. Their direction of rotation (traveling lattices) can be changed at will, in turn effecting the conveyance of the material in several directions. The bale breaker or the hopper feed, whichever is used, may be placed either in the bale room or mixing room.

If the bales are much compressed and the flakes of cotton matted together like a wad, as we often get them, do not attempt to mix them until the bales have laid open some time. Remove the bands and half the cover and let them have rest for a day before confining the compressed flakes in a large mixing. What they want in this state is air, and if left in an open state they will recover their natural condition by absorbing what air they require. Fibres of cotton are very sensitive and if exposed to a proper temperature will come back to their natural condition.

A temperature of 75 deg. in the mixing rooms will be found the best, as this temperature gives the greatest power of absorption to cotton fibres.

The amount you mix will, or should be, governed by the quantity used, but, as a rule, mix enough to last one week, for mixings generally have more attention given to them when they are not too frequent. Besides, the numbers of yarn will run more evenly and give better spinning than where small quantities are used.

Whether mixing for warp or filling the cotton should be as nearly equal in length of staple as possible, for when short and long cottons are mixed together, the long staple being a heavier body tends to throw out the short staple and the yarn is sure to be unequal and uneven, etc.

Although the main object of mixing is to equalize differences of quality, cleanliness, staple, color, etc., in one lot of cotton, caused by the product of different plantations being mixed at ginneries or at the market, yet in many instances the blending of various cot-

tons has to be done with the object of economy, for which reason we may have to mix a better (higher priced) quality with a poorer (cheaper) quality of cotton.

It is essential to consider the price of the cottons mixed, so as to arrive at an average value. This question is subservient to their mixing qualities, that is, as to color, staple and other characteristics.

In the hands of a man who can skillfully blend various qualities, the economical results obtained are surprising. To be successful, however, a thorough knowledge of the different kinds of cotton available is absolutely necessary and anyone who neglects, or is ignorant of this side of the subject, will make a woeful failure.

Mixing is of greater importance for medium yarns than for either low or high grade yarns. In many cases two, three or several qualities are mixed with a certain weight of waste produced by the several operations, and care must be taken to thoroughly incorporate this waste with the higher qualities, forming the real basis, the object being to give the most useful and economical averages. Many a good mixing has been spoiled by want of prudence or by recklessness on the part of the operatives. Warp mixings may be of a darker color because the yarn produced is darker owing to the increased twist, warp yarns being hard twisted.

When you begin to take the cotton from the mixing for use, pull it out straight, from bottom to top, and keep it as straight as a wall until the whole is done. This will make an even distribution of the fibres from a given amount of cotton.

A good way to mix dyed cotton is to have two mixings wherever possible. Use one first, then put down the mixing in the empty place and let it stand until you use the other. Each should last from three days to a week, the latter preferred. The cotton in the mixing that is resting is gaining its best condition for working, and this will repay many times the trouble in regularity, easy drawing and less waste.

In some mills where little or no provision has been made for the storage of cotton, it becomes inconvenient to make mixings, which process is thereby obviated, but greatly to the disadvantage of the mill; and under such circumstances the cotton from the bales is sometimes fed to the hopper feeder or direct to the picker without a mixing, with the result that provided mixing at the scutchers or drawing frames is neglected, irregularity in the yarns becomes a common source of complaint. In mills where such is the case the Bourne traveling platform for picker rooms should be used since by means of it mixing as well as ageing of the cotton will result, in turn resulting in a more even and stronger yarn. With reference to said platform we find in line with each opener picker or picker feeder, a rack placed bedded in the floor under a platform of separate planks, which are removable by hand. After the cotton is placed on the platform, one man with a bar can move the entire load. The cotton supplied at the delivery end is always aged by the time it takes to travel from one end of the platform to the other, and during the processes of loading and unloading the cotton will be thoroughly opened up and mixed. The idea is so simple that it is easily installed by carpenters, so that the proprietors of the device, the Draper Company, simply sell the right to use, and furnish castings for the rack when desired.

When mixing cotton for strong yarns for the production of velvets, velveteens, alpacas, and mohair fabrics for example, a long and strong staple such as brown Egyptian is most suitable, a feature which readily explains its constant increase of importation. This cotton is known for its brown color and silky feel, its color and much of its strength being due to the endochrome or inner coloring matter which is stored up in the cell wall of the fibre. Now and then this class of cotton varies in color, some bales instead of being brown being almost white. If such bales are mixed indiscriminately with other bales of a browner color, it will tend to cause a discoloration of the yarn, and where the yarn is the whitest in color, there is every chance of its being weaker in those parts since the lighter colored brown Egyptian is weaker in the staple, probably owing to a paucity of the endochrome that is deposited internally in the inner part of the wall of the fibre. The several quotations under which

Egyptian cotton is priced in the market are good, fully good fair, good fair and fair which is the lowest quality. Between the grades good and fully good fair there is often an intermediate grade adopted, called extra fully good fair. Other quotations are sometimes used and are based upon the cotton being better in staple and in the general crop having come out better than was anticipated. Equality of length in staple and freedom from impurities are the essential points to be considered in mixing brown Egyptian. Irregularity of length, unless the short fibres are combed out, must tell seriously upon the twist or warp yarn, whichever it may be, and as the cottons are higher in price than our Uplands it means a greater loss when the yarns are spun defectively. The filling for velvets is often spun from a mixing of "peelers," which is about the best of our short stapled cottons, and is a cotton characterized by its silky nature, in the present instance producing a good covering to the two-fold brown Egyptian warp which forms the backbone of most velvets. When mixing Egyptian cottons with Florida Sea Island, which is of a different color but of similar length of staple, make the mixture in the drawing frame.

POINTS ON COTTON CARDING.

A close and careful examination of the action of the card upon a certain quantity of cotton, together with the number of points of wire, or card teeth, acting upon a specific number of fibres as they pass a card of given dimensions will give an idea of the action of the carding engine upon the cotton fibres. It will generally be found that too much is expected from a carding engine, as in the eagerness to get the largest production possible from a specific plant of machinery, there is little regard given to the quality of the carding upon which so much depends for the quality of the yarn and the product of the mill. Experience in mill management clearly demonstrates the great importance of not overloading the card.

Cotton when received at the mill may be examined and mixed with the utmost care and faithfulness, yet great variations in the invoices and the difference in the effect upon the carding quality of the various grades of cotton will not be entirely overcome, and therefore it is quite essential that the cards should not be loaded beyond their capacity in order to card the hardest working cotton fairly well, if a good quality of yarn is expected.

Part of the objects to be obtained by the card are to lay the fibres as nearly parallel as possible, to remove the motes, bits of unripe seeds, neps and all other impurities, including very short fibre and lint from the surface of the seeds, and that which is made by the imperfect action of the saw gin and other destructive processes upon the delicate and minute fibres.

It is not uncommon after the most careful selection in buying, opening, and mixing the cotton to find the work of a mill in an imperfect condition. A careful inspection of the yarn often reveals the results of poor ginning, the fibres being rolled into very small balls or neps. If we take up a pound of cotton from a lap with about one hundred millions of fibres and find in it large quantities of lint, dirt, motes, and neps, we realize the importance of bringing the carding operation up to a requisite point of perfection in order to dispense with the necessity of the more expensive operation of combing, which cannot be afforded on some classes of goods where it is desirable for superior running work and first quality of goods.

By the draft in the card, the removal of more of the heavy dirt, the reduction of the surface of the laps to as near perfect evenness as possible, both in variation in weight per square yard and a level surface, is accomplished and the liability of cut fibre in the thick portions of the lap greatly diminished.

Previous to determining the weight of the sliver and draft of the card it must first be decided what number of grains the delivery at the railway head should weigh, provided a railway head is used. For example, if we have 100 grains per yard for the delivery mentioned, with ten cards composing the section, and five of a draft on the head, the rule is thus:—Multiply the draft in the head by the weight desired, and divide the product by the number of cards in the section; the

quotient will be the weight required from each card. $5 \times 100 \div 10 = 50$ grains per yard from each.

In order to supply a demand or change to different counts, it is sometimes necessary to increase the quantity of production, which is generally best done by quickening the speed of the doffer in proportion to amount fed. An objection against this method of increasing production is based on the fact that the doffer is pressed harder in the ratio of the speed imparted to the feed, while the main cylinder, on account of its velocity not being increased, has the same amount of extra work per square inch as if the weight of the lap fed to the card had received additional ounces to the yard.

It is evident that the amount of carding done is increased by the use of hardened steel wire, and the efficiency of the carding is extended by the surfaces of all parts of the wire being in perfect working distances on all parts of the card. To have a card work economically it should not card one ounce per hour more than it can do well and make the strongest yarn possible from a specific quality of cotton, and this in connection with the machines in the preparatory processes in good working condition.

TYING UP JACQUARD HARNESS FOR 2, 3 AND MORE PLY CLOTH.

In the April number of the Textile World Record we gave by means of Fig. 5 on page 97, a most thorough explanation of "how to tie up the Jacquard harness for single cloth," and we now will proceed with more complicated tie-ups as used in connection with fabrics constructed either with two systems warp one system filling, two systems warp two systems filling; union fabrics comprising single as well as double cloth tie-ups; fabrics constructed with three systems warp one system filling, or three systems warp two systems filling, or three systems warp three systems filling; in other words, two or three ply structures in all their variations, and by means of which the reader cannot help but master the principles of tying up a Jacquard harness for any number of ply fabrics.

THE STRAIGHT THROUGH TIE-UP IN TWO SECTIONS.

For this method of tie-up two different ways are possible: we can either use one Jacquard machine or two separate Jacquard machines for this purpose. The first mentioned system is explained by means of the accompanying diagram Fig. 1, whereas diagram Fig. 2 refers to the latter system.

USING MACHINE AND COMBER-BOARD (OR COMPART-BOARD IN TWO EQUAL SECTIONS.

This method of tying up a Jacquard harness, as mentioned before, is readily explained by means of diagram Fig. 1 and refers to the weaving of fabrics having two different kinds of warp which as a rule are of different color.

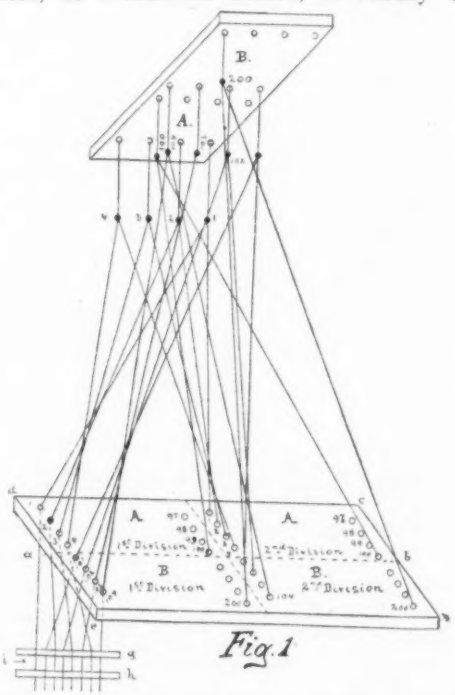


Fig. 1

Examining our illustration we find a 200 Jacquard machine used, divided in two equal parts of 100 needles each. Although as a rule a 200 Jacquard machine refers to $52 \times 4 = 208$ needles, we have used in the present diagram only 200 of these needles, i. e., 50 rows, taking no account whatever of the two extra or reserve rows. This has been done for the sake of simplifying the drawing and

in turn study of subject to the reader. As before mentioned, there are found 50 rows in 200 needles and of which we used needles 1 to 100 for the one system of warp, as indicated on bottom board of the machine by means of letter of reference A, using needles 101 to and inclusive 200 for the other system of warp, indicated respectively on the bottom board of the machine by letter of reference B.

Having given a thorough description of the method of dividing the Jacquard machine in two sections, we next will consider the comber-board and which, in this instance, has been divided width-ways into two sections (see dotted line a-b). This feature will give us, actually speaking, two comber-boards combined in one, viz: portion a-b-c-d as forming section of comber-board A, and portion a-b-f-e as forming section B of the comber-board. Section A of comber-board, which is its rear section, corresponds to section of Jacquard machine indicated correspondingly by means of letter of reference A. Section B of comber-board (its front section) in the same way corresponds to section B of the Jacquard machine, or in other words the rear half of the Jacquard machine works in connection with the rear section of the comber-board and vice versa the front section of the Jacquard machine in connection with the front section of the comber-board.

THE THREADING OF THE JACQUARD HARNESS IS DONE THUS:

Each section of the comber-board is arranged "four rows deep," corresponding in this manner to one row in depth of the Jacquard machine. The threading of the Jacquard machine to the Jacquard harness is done "from right to left" and "rear to front," the drafting of the comber-board being done correspondingly from "rear to front."

Examining our diagram, we find row number 1 of the Jacquard machine indicated in full (showing neck cords extending through comber-board, and which for the practical man will be sufficient to indicate the Jacquard machine) by means of neck cords 1, 2, 3, 4; corresponding to the same number holes in the comber-board. Needle 100 (i. e., neck cord coming from hook 100) or the last needle of section A in the machine is also shown.

With reference to section B the first row of this section, i. e., neck cords coming from hooks 101, 102, 103 and 104 are shown in connection with its harness cords threaded to the corresponding holes in section B of the comber-board, neck cord as coming from hook 200 of the Jacquard machine being also shown connected to its corresponding harness cord as in turn threaded to hole 200 in the comber-board.

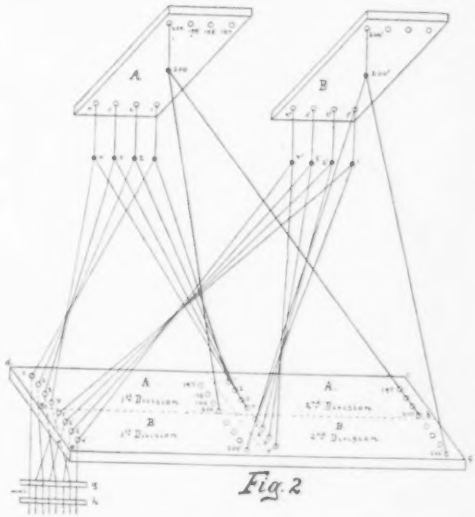


Fig. 2

Two divisions are shown in the tie-up, this being sufficient for the purpose of explaining the principles of the tie-up and in fact superior to using more divisions since in the latter instance the numerous amount of lines required to be drawn, would only bewilder the reader; g and h indicate imaginary lease rods forming the lease to the harness cord, this being done for the purpose of showing the reader the threading of this Jacquard harness, i. e., one warp thread from section A to alternate with one warp thread of section B and what would correspond to a combination in texture of fabric constructed with reference to its warp 1 : 1, i. e., one face one back warp thread, or one figure one ground warp thread, as the case may be; the threading of the lease reading thus: 1, 101, 2, 102, 3, 103, 4, 104, 5, 105, and so on until closing the division with 100, 200. Division 2, or as

many divisions as might be used, are simply a repetition of the division thus explained.

USING TWO JACQUARD MACHINES.

In diagram 2 a corresponding tie-up to the one thus explained is shown, only that in this instance two 200 Jacquard machines are used, each machine operating its own section of the comber-boards. In all other respects this

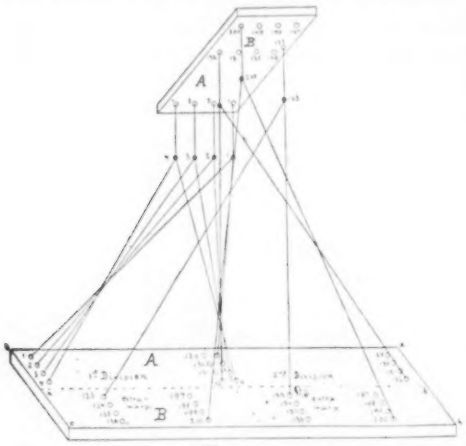


Fig 3

tie-up corresponds to the one before explained and for which reason no special explanation will be required further than mentioning that section A of the comber-board (a-b-c-d) corresponds to Jacquard machine A, and section B of the comber-board (a-b-f-e) to Jacquard machine indicated by means of letter of reference B. Using two 200 Jacquard machines in this instance for each section will bring 400 warp threads within the compass of each division, as compared to the 200 warp threads used in the previous example, or in other words two 200 Jacquard machines equal 400 needles, etc. (+ 2 reserve rows for each machine) for the present tie-up, compared to the single 200 Jacquard machine used in previous explained tie-up.

Jacquard machine A comprises harness cords indicated in our diagram 1 to 200, only the first row of neck cords of the machine and the last neck cord of the last row of the machine being shown (the latter one by means of slightly heavier line so as to form more of a contrast to the eye). Jacquard machine B comprises harness cords indicated by means of 1′ 2′ 3′ 4′, being the first row of neck cords from this machine and which finishes by means of neck cord 200′. Numerals and letters of references, with reference to machine and comber-board, are selected correspondingly and consequently anybody can readily follow the tie-up; g and h are again imaginary lease rods showing that the leasing of the harness (i) i. e., the drawing-in of the warp will be thus: 1, 1′, 2, 2′, 3, 3′, 4, 4′, 5, 5′ etc., closing the division by 200 200′. Only two divisions are shown, which, however, are sufficient to explain the use of any number of divisions as the case may require.

A UNION TIE-UP, COMPRISING THE WEAVING OF SINGLE AS WELL AS DOUBLE CLOTH,

is shown by means of diagram Fig. 3. Examining our machine, we find again a 200 machine (for the sake of simplifying the affair) used, the same being divided in this instance in two unequal portions, the larger portion or needles (and its corresponding hooks and neck cords) 1, 2 and up to and inclusive 132 being used for one section (A); needles 133 to 200 being used for the other section (B). The comber-board is arranged correspondingly, needles 1 to 132 working one section of the comber-board, all over its width (rear section), the other section of the machine, i. e., the front section B, comprising needles 133 to 200, working a portion of the front comber-board section only, the other portion of said front comber-board section not being threaded.

It will be readily seen from the diagram that where the threading of the Jacquard harness in two sections comes in the affair, the same refers to double cloth, but where the rear section only comes into play, the affair refers to single cloth pure and simple only. In the present tie-up the affair certainly refers more to figured dress goods stripes, and in which instance needles 1 to 132 are used for interlacing the ground structure of the fabric, needles 133 to 200 being used for the figure warp as producing figured stripes upon the ground structure previously referred to, a method of designing explained in the present issue of the Textile World Record under the heading of "Practical Points of Fancy Dress Goods." The lease of the tie-up would consequently read thus: 1, 2, 3, 4, 5, 6, and so on until coming to warp

thread 32. After this, double cloth leasing begins thus: 33, 133, 34, 134, and so on until closing the double leasing by means of harness cords 100, 200. After this, single cloth leasing again begins thus: 101, 102, 103, 104, 105 and so on until closing the first section of the tie-up by means of harness cord 132.

In the rear section of the tie-up, as well as section of the machine (A) we have shown harness cords 1, 2, 3, 4, and 132 threaded. In the front section of the comber-board as well as machine (figure portion of the affair) we only have shown the first and last harness cord threaded from its neck cord to its proper hole in the comber-board, i. e., harness cord 133 and 200. This has been done for the sake of simplifying the present tie-up to the reader, since provided more rows would have been shown threaded an immense number of lines would have been the result in the illustration, in turn bewildering the reader. For this same reason only two divisions of the tie-up have been shown, but each in its principles will explain the affair for any number of divisions, i. e., for any width of fabric to be made.

TYING UP A JACQUARD HARNESS FOR THREE PLY CLOTH, I. E., THREE SECTIONS.

is an affair readily explained by means of diagram Fig. 4. The same refers to a 400 Jacquard machine and which comprises 52 rows in its width × 8 rows deep = 416 needles, hooks, neck cords, etc. Rows 51 and 52 are known as the "reserve rows" of the machine and either can be used or not as the case may require. In our example we used one of these rows, i. e., row number 51; row number 52 not being used, and for this reason it is indicated by small dots, see arrow s.

We consequently in our present example mean by a 400 machine, a Jacquard machine having 51 × 8 = 408 needles, hooks, and neck cords, and which in the present instance we divided in three equal parts width ways (a to b) of the machine. 51 ÷ 3 = 17 rows (width ways of the machine) for each section, and 17 × 8 (depth of the machine b to c) = 136 needles, hooks and neck cords for each section of said machine. Section 1 (A) comprises needles, etc., 1 to 136. Section 2 (B) comprises needles, etc., 137 to 232. Section 3 (C) comprises needles, etc., 233 to 408.

In the same manner as we have thus divided our Jacquard machine in three equal portions we have done the same with our comber-board, dividing the same in three equal section A B C respectively. Section A of the comber-board in turn corresponds to its correspondingly indicated section of the machine, i. e., neck cords of section A of the

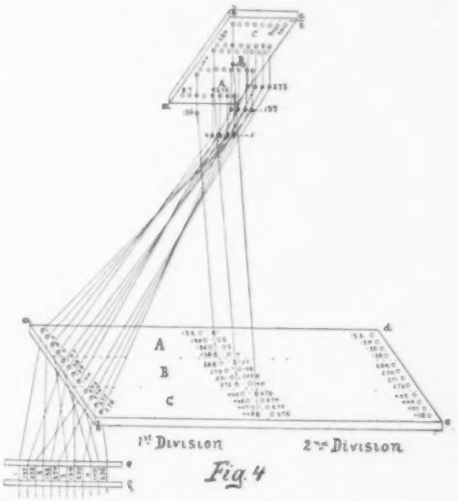


Fig. 4

machine carry those leashes of the Jacquard harness as threaded to section A of the comber-board. The same affair refers to section B of comber-board and machine, and similarly to section C of either. The first four neck cords of either section are shown, in our diagram, having its respective harness cords threaded in the comber-board, each section finishing with the threading of the last neck cord and its harness cord to its corresponding hole in the comber-board. Only two divisions are given in the tie-up, the first division only being shown threaded, both for the purpose of simplifying the diagram to the reader, since too many lines in the drawing would only bewilder the eye; e and f again indicate the imaginary leasing of the Jacquard harness which is thus: 1, 137, 273, 2, 138, 274, 3, 139, 275, 4, 140, 276, 5, 141, 277, and so forth until closing each division respectively by means of harness cords 136, 272, 408.

IMPROVEMENTS TO FINISHING MACHINERY.

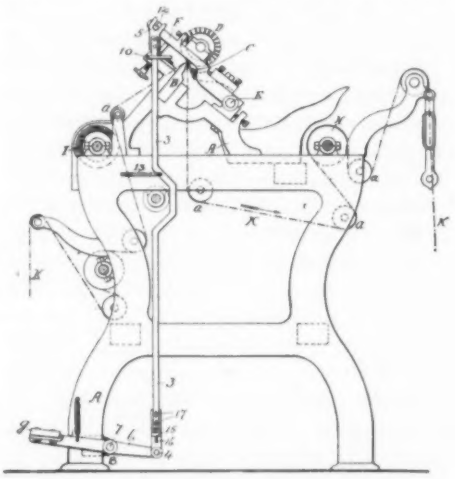
THE SHEAR.

One of the latest improvements to this machine consists in providing convenient means for facilitating the lifting of the cutting parts, comprising the shearing revolver and ledger blade, away from the guide rest, for permitting free passage over the guide rest of the end connecting seams and similar excrescences in the fabric without interference or contact with the cutters, or for any readjustment or correction in the running of the goods; also, to thus afford means whereby the attendant is enabled to raise the shearing cutters as required, while leaving both hands at liberty for distending the cloth, removing wrinkles therefrom, or for otherwise manipulating the fabric or machine as may be demanded. Previously this lifting of the cutting parts had to be performed by the attendant taking hold of the cross bar at the front of the frame on which the shearing revolver or cylinder is mounted, and this usually required him to stand centrally in front of the machine, especially in the case of a broad shear, and also requiring generally the use of both hands to properly effect the lifting of the cutting parts.

The accompanying illustration represents a side view of such parts of a cloth shearing machine as will show the nature of the new lifting mechanism.

Letters of references in the illustration indicate thus: A the main frame, B the guiding rest over which the fabric is drawn for presentation of its pile or nap to the shearing cutters, C the ledger blade, and D the shearing cylinder or revolver as mounted upon the cutter carrying frame F, that is connected by a hinge to the stationary frame A by the shaft or axis E and is adapted to swing upward or away from the guide rest B. H indicates the feed or draft roll, I the brush, and a the guide rollers for directing the cloth (represented by the dot and dash line K) through the machine in the direction indicated.

Referring to the new lifting device more particularly we find provided at each side of the machine a lifting connection 3, having an upper end or head 5 operatively engagable with the cutter carrying frame F, while its lower end is joined by a pivot-stud 4 to the rear arm of a rocker-lever 6, that is mounted on a fulcrum axis or shaft 7, supported in stationary bearings 8, fixed to the lower part of the frame A, said shaft being movable in its bearings and extending across the frames for uniting the rocker-levers at each side of the machine to rock in unison; g indicates a pedal-bar or foot board supported upon the forwardly-projecting arms of the rocker-levers 6 and which foot board extends across the front of the machine. The upper part of



the connecting-bar 3 is supported to slide in a guide 10, attached to machine-frame, and the head 5 of the bar is furnished with a jaw adapted to engage with a projection 12, fixed in the end of the cutter carrying-frame. The slot or opening through the guide 10 is elongated to permit limited backward-and-forward swing of the bar 3 to accommodate the curved line of movement of the hinged frame F, and a small spring 13 being attached to the connecting bar to normally draw it to the front end of said slot.

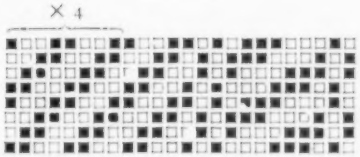
The jaw of the forked head 5 is best disposed in inclined position or arranged to approximately correspond with the arc or line of movement of the swinging end of the frame F, and said jaw is open upwardly, but engages beneath the stud 12, so that while the cutter carrying frame F can also be lifted

independently by hand by the hand bar (not shown) as provided in front to the cutter carrying frame, without reference to the connection 3, the studs 12 passing by this method of lifting the cutting device out of the forks 5 and returning thereinto when the frame is again dropped to working position. The connecting rods 3 are provided at either their upper or lower ends with adjusting means for varying the length thereof. Said means consist of a grooved bracket 15, embracing the bar 3 and provided with an endwise adjusting screw 16, fitted in a lug thereon, and clamping-screw 17, arranged through longitudinal slots in the plate of the member for holding and releasing the adjustment.

In the operation of the machine the attendant by placing his foot upon the foot board 9 effects the lifting of the cutting parts away from the guide-rest whenever necessary or desired without passing to the central front of the machine.

NOVELTIES FROM FOREIGN SOURCES.

Worsted Suiting (Stripe).



Complete Weave. Repeat 48 × 4.

Warp:—4,860 ends in warp, 12-harness fancy draw.

Reed:—19 × 4 = 64 inches wide in loom.

Dress:—

1 end, 2/64's worsted, gray and white twist... } × 18 = 36 ends.
1 end, 2/64's worsted, dark gray..... }
1 end, 2/64's worsted, gray and white twist..... = 1 end.
1 end, 2/64's worsted, cinnamon brown..... = 1 end.
2 ends, 2/64's worsted dark gray ..... = 2 ends.
2 ends, 2/64's worsted, gray and white twist ..... = 2 ends.
1 end, 2/64's worsted, dark gray..... = 1 end.
2 ends, 2/64's worsted, gray and white twist ..... = 2 ends.
2 ends, 2/64's worsted, dark gray ..... = 2 ends.
1 end, 2/64's worsted, cinnamon brown..... = 1 end.
1 end, 2/64's worsted, gray and white twist .. } × 8 = 16 ends.
1 end, 2/64's worsted, dark gray ..... }
1 end, 2/64's worsted, gray and white twist..... = 1 end.
1 end, 2/72's worsted, red..... = 1 end.
1 end, 2/64's worsted, gray and white twist... } × 9 = 18 ends.
1 end, 2/64's worsted, dark gray..... }
1 end, 2/64's worsted, gray and white twist..... = 1 end.
1 end, 2/64's worsted, green..... = 1 end.
2 ends, 2/64's worsted dark gray..... = 2 ends.
2 ends, 2/64's worsted, gray and white twist..... = 2 ends.
1 end, 2/64's worsted, dark gray..... = 1 end.
2 ends, 2/64's worsted, gray and white twist..... = 2 ends.
2 ends, 2/64's worsted, dark gray..... = 2 ends.
1 end, 2/64's worsted, green..... = 1 end.

Repeat of pattern: 96 ends

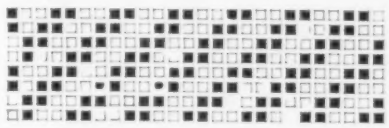
Filling:—78 picks per inch, arranged thus:

1 pick, 2/64's worsted, black and white twist... } × 55=110 picks.
1 pick, 2/64's worsted, black..... }
1 pick, 2/64's worsted black and white twist..... = 1 pick.
1 pick, 2/72's worsted, red..... = 1 pick.

Repeat of pattern: 112 picks

Finish:—Worsted finish, 56 inches wide.

Woolen Cheviot Suiting (Stripe effect).



Complete Weave. Repeat 26 × 4.

Warp:—2,296 ends, 8-harness fancy draw.

Reed:—17½ × 2 = 65⅝ inches wide.

Dress:—

1 end, 2/40's worsted, black and green twist..... = 1 end,
1 end, 2-ply 4-run woolen yarn twist, drab and white. } × 3 = 24 ends. } × 3 = 78 ends.
1 end, 3½-run woolen yarn, br'n
1 end, 3-run woolen yarn, white
1 end, 3½-run woolen yarn, br'n
1 end, 2-ply 4-run woolen yarn twist, black and white
1 end, 3½-run woolen yarn, br'n
1 end, 3-run woolen yarn, white
1 end, 3½-run woolen yarn, br'n
1 end, 2/40's worsted, black and white twist..... = 1 end,
1 end, 2/40's, worsted, black and green twist..... = 1 end.
1 end, 2-ply 4-run woolen yarn twist, drab and white... = 1 end.
1 end, 3½-run woolen yarn, brown ..... = 1 end.
1 end, 3-run woolen yarn, white ..... = 1 end.
1 end, 3½-run woolen yarn, brown. ..... = 1 end.
1 end, 2-ply 4-run woolen yarn twist, black and white.. = 1 end.
1 end, 2-ply 4 run woolen yarn twist, red ..... = 1 end.
1 end, 3-run woolen yarn, white ..... = 1 end
1 end, 2 ply 4-run woolen yarn twist, red ..... = 1 end.
1 end, 2-ply 4-run woolen yarn twist, drab and white ... = 1 end.
1 end, 3½-run woolen yarn, brown..... = 1 end.
1 end, 3-run woolen yarn, white..... = 1 end.
1 end, 3½-run woolen yarn, brown..... = 1 end.
1 end, 2/40's worsted, black and white twist..... = 1 end.
1 end, 3½-run woolen yarn, brown..... = 1 end.
1 end, 3 run woolen yarn, white..... = 1 end.
1 end, 3½-run woolen yarn, brown..... = 1 end.
1 end, 2 ply 4-run woolen yarn twist, drab and white ... = 1 end.
1 end, 2-ply 4-run woolen yarn twist, green..... = 1 end.
1 end, 3-run woolen yarn, white..... = 1 end
1 end, 2-ply 4 run woolen yarn twist, green..... = 1 end
1 end, 2/40's worsted, black and white twist..... = 1 end.
1 end, 3½-run woolen yarn, brown ..... = 1 end.
1 end, 3-run woolen yarn, white ..... = 1 end.
1 end, 3½-run woolen yarn, brown..... = 1 end.
1 end, 2/40's worsted, black and white twist..... = 1 end.

Repeat of pattern: 104 ends.

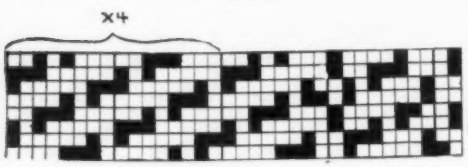
Filling:—43 picks per inch, arranged thus:

113 picks, 3½ run woolen yarn, black.
1 pick, 2-ply 4-run woolen yarn twist, green.
1 pick, 3½-run woolen yarn, black.
1 pick, 2-ply 4-run woolen yarn twist, green.
9 picks, 3½-run woolen yarn, black.
1 pick, 2-ply 4-run woolen yarn twist, dark red.
1 pick, 3½-run woolen yarn, black.
1 pick, 2-ply 4-run woolen yarn twist, dark red.

128 picks in repeat of pattern.

Finish:—Woolen cheviot finish; scour well, clip on shear, steam and press; 56 inches finished width.

Worsted Trousering.



Complete Weave. Repeat 82 × 8.

Warp:—8,635 ends, 16-harness fancy draw.

Reed:—16 × { 8 dents @ 8 ends / 2 dents @ 9 ends } = 66 inches width of fabric in reed.

Dress:—

1 end, 100/2's silk, white.
29 ends, 2/64's worsted, dark drab and pearl twist.
1 end, 2/64's worsted, black.
1 end, 2/64's worsted, dark drab and pearl twist.
1 end, 2/72's worsted, drab.
1 end, 2/64's worsted, gray and white twist.
2 ends, 2/52's worsted, black and blue twist.
1 end, 2/72's worsted, drab.
1 end, 2/64's worsted, gray and white twist.
1 end, 2/64's worsted, black.
29 ends, 2/64's worsted, dark drab and pearl twist.
1 end, 100/2's silk, white.
1 end, 2/64's worsted, dark drab and pearl twist.
3 ends, 2/64's worsted, black.
1 end, 2/72's worsted, drab.
1 end, 2/64's worsted, gray and white twist.
2 ends, 2/52's worsted, black and blue twist.
1 end, 2/72's worsted, drab.
1 end, 2/64's worsted, gray and white.
3 ends, 2/64's worsted, black.

82 ends in repeat of pattern.

Filling:—70 picks per inch, all plain, 2/64's worsted, black.

Finish:—Worsted finish, 56 inches wide.

Worsted Suiting (Stripe).

Complete Weave. Repeat 48 × 4.

Warp:—4,160 ends, 14-harness fancy draw.

Reed:—16 × 4 = 65 inches width of fabric in reed.

Dress:—

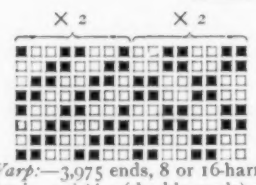
1 end, 2/40's worsted, black = 1 end.
1 end, 2/40's worsted, mix = 1 end.
3 ends, 2/40's worsted, black = 3 ends.
1 end, 2/40's worsted, pearl = 1 end.
3 ends, 2/40's worsted, black, } × 3 = 12 ends.
1 end, 2/40's worsted, black and pearl twist, }
1 end, 2/40's worsted, black = 1 end.
1 end, 2/48's worsted, cinnamon brown = 1 end.
2 ends, 2/40's worsted, black = 2 ends.
1 end, 2/40's worsted, mix = 1 end.
2 ends, 2/40's worsted, black = 2 ends.
1 end, 2/40's worsted, pearl = 1 end.
2 ends, 2/40's worsted, black = 2 ends.
1 end, 2/40's worsted, mix = 1 end.
2 ends, 2/40's worsted, black = 2 ends.
1 end, 2/48's worsted, dark green = 1 end.
1 end, 2/40's worsted, black = 1 end.
1 end, 2/40's worsted, black and pearl twist, } × 3 = 12 ends.
3 ends, 2/40's worsted, black, }
1 end, 2/40's worsted, pearl = 1 end.
2 ends, 2/40's worsted, black = 2 ends.

Repeat of pattern: 48 ends.

Filling:—65 picks per inch, all plain; 2/40's worsted, black.

Finish:—Worsted finish, 56 inches finished width.

Worsted Suiting (Stripe effect).



Complete Weave.
Repeat 32 × 4.

Warp:—3,975 ends, 8 or 16-harness fancy draw.

Reed:—15½ × 4 (double reeds) = 64 inches wide in loom.

Dress:—

1 end, 2/36's worsted, gray and white twist = 1 end,
1 end, 2/36's worsted, black = 1 end,
1 end, 2/36's worsted, gray and white twist = 1 end,
1 end, 2/36's worsted, black ... } × 8 = 16 ends,
1 end, 30's worsted, and 2/60's worsted, dark gray twist ... }
1 end, 2/36's worsted, black ... } × 6 = 12 ends, } × 3 = 96 ends.
1 end, 40's worsted green, and 2/80's worsted drab and cinnamon twist ... }
1 end, 2/36's worsted, black = 1 end,
1 end, 2/30's worsted, gray and white twist = 1 end.
1 end, 2/36's worsted, black = 1 end.
1 end, 2/36's worsted, gray and white twist = 1 end.
1 end, 2/36's worsted, black.
1 end, 30's worsted and 2/60's worsted, dark gray twist } × 5 = 10 ends.
1 end, 2-fold, 2/64's worsted, black and red twist = 1 end.
1 end, 30's worsted black, and 2/60's worsted dark gray twist = 1 end.
1 end, 2/36's worsted, black = 1 end.
1 end, 30's worsted black, and 2/60's worsted dark gray twist = 1 end.
1 end, 2-fold, 2/64's worsted, black and red twist = 1 end.
1 end, 30's worsted black, and 2/60's worsted dark gray twist = 1 end.
1 end, 2/36's worsted, black.
1 end, 40's worsted green, and 2/80's drab and cinnamon twist } × 6 = 12 ends.
1 end, 2/36's worsted, black = 1 end.

Repeat of pattern: 128 ends.

Filling:—66 picks per inch, arranged thus:

1 pick, 2-fold, 2/64's worsted, black and red twist.
3 picks, 2/36's worsted, black.
1 pick, 2-fold, 2/64's worsted, black and red twist.
159 picks, 2/36's worsted, black.

164 picks in repeat of pattern.

Finish:—Worsted finish, 56 inches wide.

MOIRE EFFECTS ON THE LOOM.

A German firm has discovered a method of producing moire effects during the weaving process. The yarn after it leaves the warp beam passes over a roller having a variable diameter. When the high places come opposite the yarn the latter is subjected to an increased tension which is relaxed when the lower parts of the roller are reached. This causes the yarn to run alternately tight and slack in the cloth and produces the well-known moire effect which can be varied at will by changing the form of the roller. This variation of the tension must, as a matter of course, be confined within narrow limits, otherwise the yarn would be broken by the strain. It is said that very good results are obtained by this process.

PRACTICAL POINTS ON FANCY COTTON DRESS GOODS.

In this line of textile fabrics, "extra warp effects" are now coming more and more in favor, both with reference to Harness as well as Jacquard work, for which reason the present article will be of special interest to our readers.

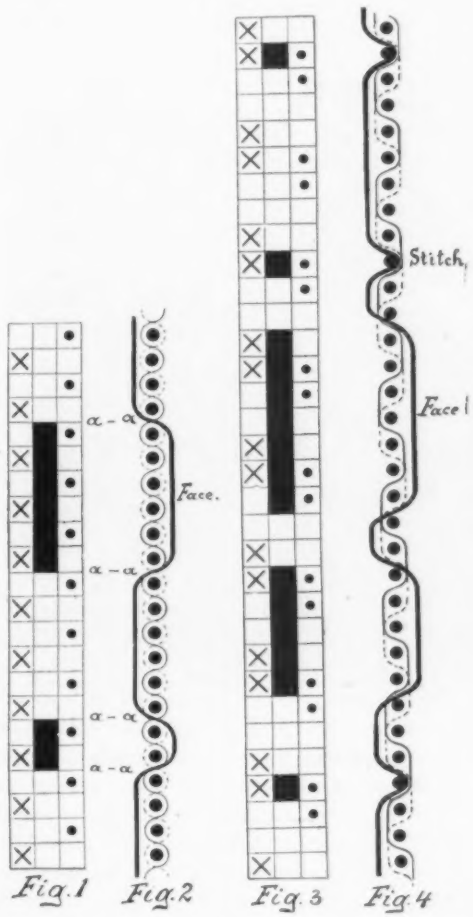


Fig. 1 Fig. 2 Fig. 3 Fig. 4

Technically considered, they are fabrics constructed with 2 systems of warp, 1 system of filling; one system of warp and the filling forming the ground structure of the fabric, the second system of warp being employed to produce the figure upon this ground structure. As a peculiarity of this second system of warp we must mention that said warp is only visible on the face of the fabric at certain places (as regulated by the design), while otherwise it is made to float on the back of the structure, either floating loosely throughout or being stitched to the ground structure in certain places, not visible on the face.

THE PRINCIPLE OF THE CONSTRUCTION of these fabrics is readily explained by means of diagrams figs. 1 to 4 respectively, and of which Fig. 1 illustrates a portion of a weave showing: —

1 ground warp thread in ⊡ squares,
1 figure " " " ■ squares and
1 ground " " " × squares.

3 warp threads thus being shown.

The ground warp is shown to interlace with the common plain weave, the figure warp interlacing $\frac{1}{4}\frac{6}{6}\frac{2}{4}$, changing from face to back and vice versa at places indicated by letter of reference a.

Fig. 2 is a longitudinal section through the fabric (with reference to weave fig. 1), every warp thread shown in weave fig. 1 by ⊡ squares being indicated in diagram fig. 2 by dotted lines, every warp thread shown in weave fig. 1 by ■ squares being indicated in diagram fig. 2 by full heavy lines and every warp thread shown in weave fig. 1 by × squares being indicated in diagram fig. 2 by × solid light lines.

Weave fig. 1 and its diagram of fabric structure refer to floating the figure warp on back of the cloth, the stitching of said extra warp, not visible on the face of the structure, being shown by means of diagrams figs. 3 and 4, and of which the first, i.e., fig. 3 shows a portion of a, weave showing again

1 ground warp thread in ⊡ squares,
1 figure " " " ■ squares and
1 ground " " " × squares

3 warp threads thus being shown.

The weave for interlacing the ground-warp threads is (2 warp threads of the) the $\frac{2}{2}$ 4 harness 45° twill, the figure, warp weaving thus:

1 pick down — on back of structure;
1 pick up — stitching to the structure, not visible on the face;
7 picks down — on back of structure;
1 pick up — stitching to the structure, not visible on the face;
2 picks down — on back of structure;
7 picks up — floating on face of structure (figure effect);
2 picks down — on back of structure,
5 picks up — floating on face of structure (figure effect);
3 picks down — on back of structure,
1 pick up — stitching to the structure, not visible on the face;
3 picks down — on back of structure.

33 picks being shown.

Fig. 4 is a longitudinal section through the fabric (with reference to weave fig. 3) ; —

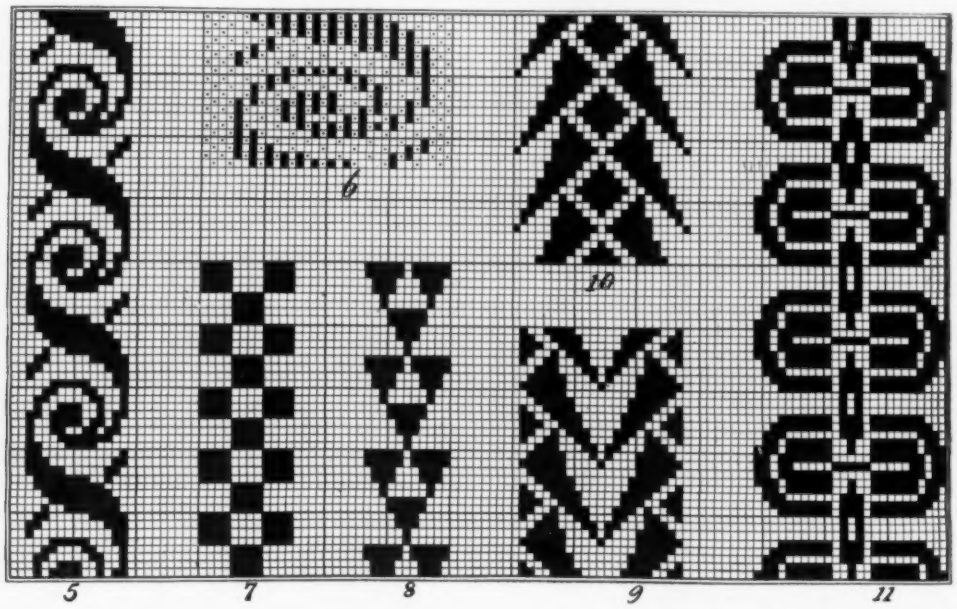
⊡ type in weave = dotted line in diagram
■ " " " = heavy solid line in diagram
× " " " = light " " " "

This method of stitching the figure warp when floating on the back of the structure is only made use of when dealing with extra long floating figures, besides it must be remembered that this stitching increases the number of harness required for the execution of the weave or design in practical work for which reason the same is little, if any, used by cotton manufacturers using harness work. Certainly with reference to Jacquard work, this stitching of the figure warp to the back of the ground structure (when required to do so and permissible by the ground weave), makes no inconvenience, since then we are not troubled by the capacity of harnesses of a dobby.

HARNESS WORK.

Diagram fig. 5 shows a sketch, executed for practical work on point paper, for a stripe for a cotton dress goods fabric a system of designing becoming at present very popular. The affair repeats on 13 warp-threads, i. e., 13 harness are required for interlacing this extra warp effect.

Fig. 6 shows the analysis of a fabric using stripe fig. 5 for fancy effect. The weave selected for interlacing the ground structure, in this instance, is the common plain weave, calling for 2 or 4 harness for its execution on the loom. The arrangement of ground and figure warp for weaving the stripe in the fabric is 1 :1. The first 3 and last 3 warp threads in weave fig. 6 refer respectively to the joining portions of plain ground structure in the fabric, and



which portion may be heightened with reference to "fancy effect," either by fancy color combinations, heavy threads (cord effects), or 2, 3, or more threads working at proper intervals alike (rib or imitation basket effects) either case requiring no increase in the number of harnesses. Certainly where this feature should make no difference (dealing with a dobby having a high number of harness capacity) other fancy weaves can with advantages be introduced. However, as a rule, most of these fabrics are produced on looms having a limited capacity of harness, a feature taken care of in the preparation of the illustrations for this article.

IDEAS FOR STRIPES FOR DRESS GOODS.

This is as might be mentioned—besides hav-

ing given a thorough description of the construction of these fabrics—the purpose of the present article, a feature which will make it of special interest to our designers and manufacturers.

Fig. 7 shows a neat basket effect stripe, requiring for its execution only 2 harness.

Fig. 8 is another neat small stripe calling for 6 harness only (point draw.)

Fig. 9 can be woven by means of a point draw with 11 harness, and Fig. 10 by means of a similar draw with 12 harness.

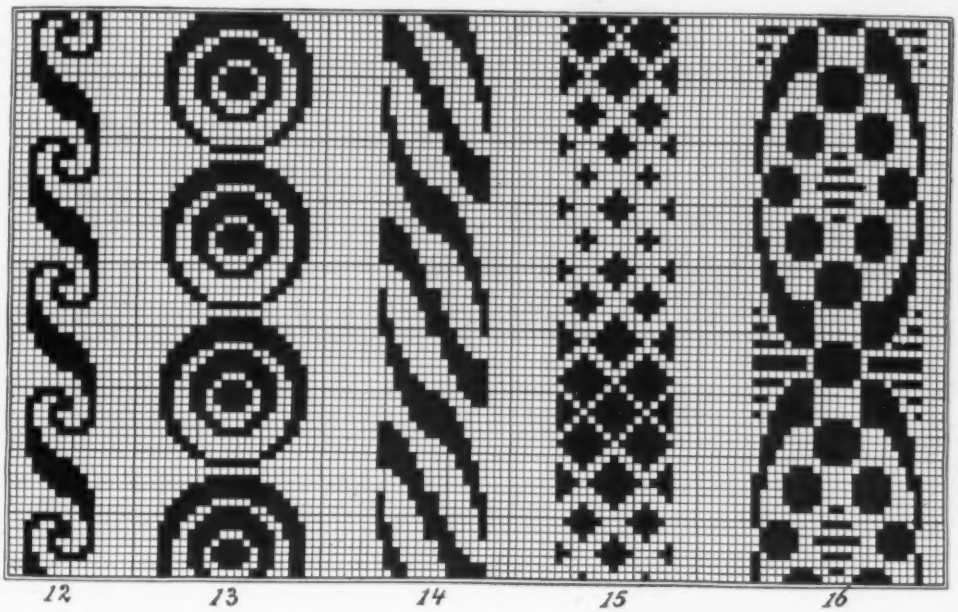


Fig. 11 repeating on 25 warp threads and being quite an elaborate effect for a stripe only calls for 9 harness for its execution.

Fig. 12 shows a smaller effect in scroll work as compared to design fig. 5, repeating on 9 harness only.

Fig. 13 shows a shaded "polka dot" stripe repeating on 19 warp threads — being quite an elaborate effect for the fact that only 9 harness are required for its practical execution in the loom.

Fig. 14 shows a curved twill effect repeating on 14 warp threads and calling for 13 harness at weaving.

Fig. 15 shows a shaded ribbon effect, constructed on the point draw principle (large repeat of effect produced with few harness). Repeat of effect 15 warp threads. Number of harness required for its execution, either 5 harness or 8 harness. In the first instance draw: — 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2 and in the later instance thus: — 1, 2, 3, 4, 5, 6, 7, 8, 7, 6, 5, 4, 3, 2, 1.

Fig. 16 has for its repeat 22 harness and can be woven with 11 harness point draw, drafting the point harness twice.

FLORAL EFFECTS.

We next come to a plate of designs representing floral effects for the present system of stripes for dress goods. Of said designs

Fig. 17 calls for 14 harness straight draw = 14 warp threads in repeat of pattern.

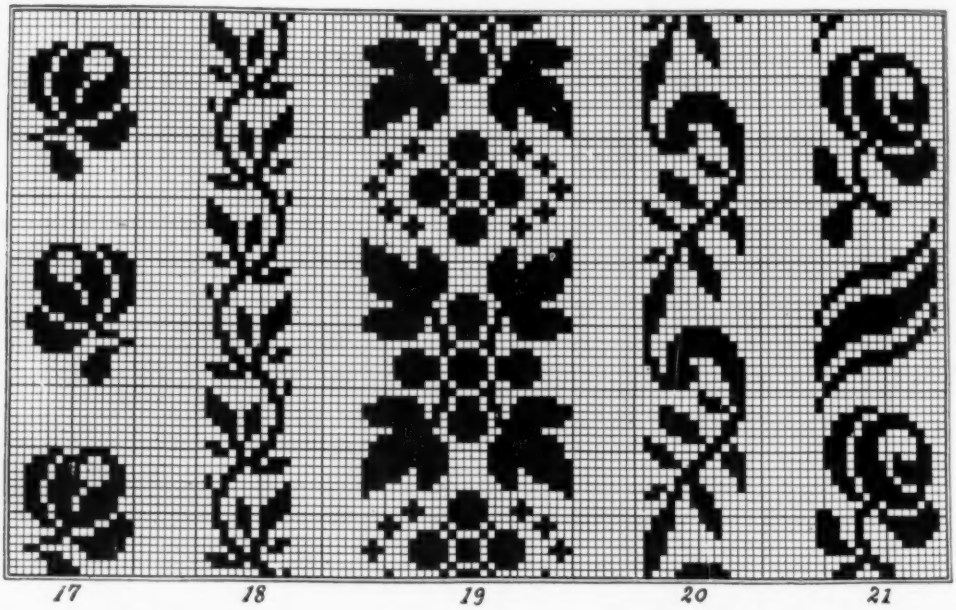
Fig. 18 requires 11 harness straight draw for its execution = 11 warp-threads in the repeat of pattern.

Fig. 19 is quite an elaborate floral effect stripe, repeating on 27 warp threads, but which by means of its proper point draw can be woven on as low as 13 harness only.

Fig. 20 repeat 13 warp threads — straight draw and

Fig. 21 repeat 16 warp threads also straight draw.

(To be continued.)



THE FEELER OF THE NORTHROP LOOM.

(Abstract from a paper read by Gen. William F. Draper, Hopedale, Mass., before the New England Cotton Manufacturers at Boston, April 22.)

We have developed the so-called feeler mechanism, and have sold thousands of looms of which it has formed a part. Though it has been a success, and though looms fitted with it have made a superior quality of cloth, it has been handicapped by the fact that there is, and must be, a loss of waste on each bobbin thrown out before it is exhausted, and by the further and more serious fact that the amounts thrown out have been uneven and excessive in many cases. Careful study has developed the fact that these variations have been due to two causes; first, the looseness of the crank shaft in its bearings, that controls the notion of the lay; and second, that an adjustment of the box plate to regulate the pick has required also a resetting of the feeler, which it has not always had.

Mr. Aumann, agent of the Dwight Co. of Chicopee, has invented a device which we have adopted, which overcomes the first of these troubles, and the author of this paper and his son, Clare, have, we hope, cured the other, by having the piece carrying the feeler lever contact with the box plate wherever it may be. With these devices neither looseness of the crank arms, nor setting the box plates, affect the operation of the feeler materially, and we expect that the amount of waste will be greatly reduced on looms that we send out hereafter. Further, when once the feeler is properly set, it will not require readjustment unless some of the parts slip or get out of place. We are now shipping feeler looms made on these lines, and getting very favorable results.

We have also arranged to reduce waste by applying a so-called bunch builder to the spinning frame. This winds a narrow bunch on the bobbin, with a warp wind, and then automatically changes to the filling wind and fills the bobbin. In weaving off, the yarn spun with the filling wind is first exhausted, and then the narrow bunch is reduced in size until the feeler operates, and the amount of waste made is but trifling, if the parts are properly set. This bunch builder on the spinning frame is a most desirable adjunct to the feeler system.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

AUTOMATIC OILER FOR SPINDLE BEARINGS.

BY PAUL LAMOITIER.

There are many inconveniences connected with oiling mule and self acting spindles; ordinarily it is done very quickly and without care on the part of the spinner. This causes a considerable waste of oil, irregular oiling and a scattering of the oil around the room, much of which finds its way to the spindle bands causing trouble from unequal tension and varying friction of the same on the spindle whorls, resulting in the bands wearing out rapidly; the oil becomes black, gets on the fingers of the operatives causing bad splicings.

This problem of automatic oiling on self acting spindles has for a long time attracted the attention of inventors, but up to the present, however, the different attempts to solve the problem have not been entirely successful; they have the inconvenience of being slow and of not being automatic. For this reason I am confident that the invention to which I am about to call attention will prove interesting to American spinners.

L. J. Geis, manager for Ph. Dufourmantel & Co., spinners at Moscow, Russia, conceived the idea of saving the oil which is scattered by the spindles. An upright section of the device is shown at Fig. 1, and a plan at Fig. 2. The parts are indicated as follows: E, a wick, the lower end of which rests in the oil and the upper end in a groove as shown; the oil is then carried by capillary attraction to the spindle; B, a collar fastened to the spindle; the oil runs down the spindle and when it strikes the collar is thrown by centrifugal force against the walls of the reservoir, D, and against the shield G, from which it finds its way to the bottom of the reservoir; G, a cover or shield, which surrounds the spindle and serves to collect the waste oil as shown. D, the oil reservoir.

It has been very interesting to watch the operation of this oiler in cotton spinning mills where the spindles are run as high as 11,000 turns per minute, heretofore causing a heating of the spindles and collars and at times even causing sparks. Tests made in a large spinning mill at Moscow have led the manager to say that this new oiler surpasses all others and is a really ideal device. The spindles and collars remain at the temperature of the room, conclusive proof of the perfect lubrication. The disk, B, is not necessary for such medium speeds as are used in spinning wool (3,000 to 7,000 turns per minute).

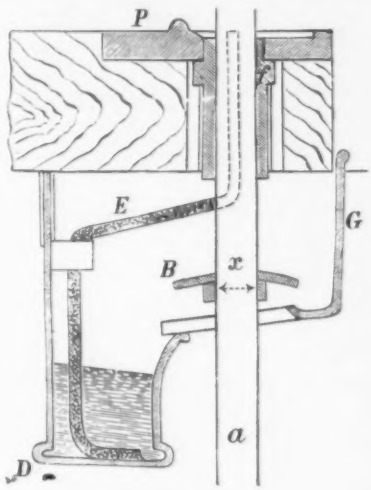


FIG. 1.

The wick is kept in place by a very simple arrangement. The oiler is very simple and can be readily applied to any kind of spindle. There is no wear on the wick and it is scarcely touched by the spindle. There is no waste while the machine is stopped and the

economy of oil amounts to 50 or 80 per cent. As a consequence the best grades of oil can be used, which, owing to the price, are but little used in Russia at present. The oiler does not require replenishing or cleaning oftener than once a month, while with the old devices in use in Russian mills it is necessary to clean the spindles every two hours. The reservoir can be filled without disturbing

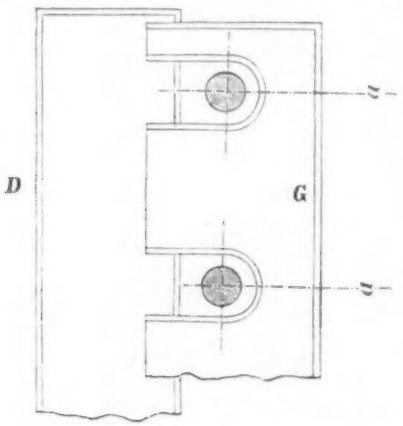


FIG. 2.

the machine in any way. Among the advantages of this device may also be mentioned the saving of power and regularity of oiling. The oiler can be taken from the machine without disturbing the spindle.

This device enables the spindle to be adjusted to better advantage, the spindle being held exactly in the centre of the ring, which is a very desirable feature in ring spinning. The oiler is now in use on all of the spindles in the Dufourmantel mills and in several other large Russian mills, including the Marosoff, Danilovscki, etc.

The oiler has been in use on one self actor of 650 spindles for four years and given perfect satisfaction. The invention has been patented in the principal manufacturing countries and the inventor desires to dispose of the American rights.

—A Russian gentleman who recently visited the cotton mills at Ware, Mass., expressed his astonishment at the good clothes worn by the operatives, saying that they were much superior to those worn by mill operatives in Russia.

ENGLISH NOTES.

(From our Special Correspondent.)

The Playne-Macdonald system of indigo dyeing is one more effort in behalf of natural indigo in its combat with synthetic indigotine. Negotiations now afoot make it not unlikely that the process will be exploited in America. Reports received show a good margin in favor of the natural paste. The results obtained from a ten minute's bath show it to be a very powerful dye.

The Playne system is a time saver in two senses. While 6 1/2 hours were spent in preparing from laboratory vats of the customary type, less than 1 1/2 hours were occupied by the new method. On this facility of the preparation and the rapidity of the dyeing the inventors base the utility of their process.

Nothing elaborate in the way of plant is called for. A mixing vessel upon a higher level than the precipitating vats is the most conspicuous feature. Internal steam coils are used for heating. The mixer is charged first with 250 gallons of water, about 14 pounds of carbonate of potash and 8 pounds of fine commercial indigo. To this is added fine zinc dust stirred in a solution of bisulphite of soda (54° Tw.), the zinc forming a proportion of from 12 1/2 to 25 per cent. as required. The liquor is boiled and stirred; the steam is shut off when the frothing begins to subside and the vat should clear immediately.

The dye-vat to be "set" is half filled with soft water raised to boiling into which the clear liquor from the mixer is run, well below the surface. Some of the liquor is then taken out to be mixed with 40 to 50 pounds of indigo paste ground in glycerine (containing 8 to 10 pounds of fine commercial indigo). This mixture is carefully strained back and the vat filled up with cold water thus making 1,400 gallons of dye at approximately 150° F. The dyeing begins at once. Efficient hawking is needed. After the cloth is aired and wrung, a run through hot water soured with H Cl is recommended to bring out the beauty of the shade. How the astonishingly rapid precipitation would affect heavy fabrics only experience can determine. On light serges the results leave no room for complaint.

When the native Frenchman, German or Japanese cancels goods he does it with courtesy. His explanation may appear insufficient but he will reason a little. It is complained of Americans that they will not discuss and that the higher handed their action the less communicative they become. That, to the British mind, is indefensible.

During a little crisis in the braid trade a Yorkshire shipper had consignments of yarn left for account on all hands. His principal customers in America, with no embellishment whatever, told him to "Go to Gehenna," when he called to effect some settlement. He did return home after closing every single account and the dollars are not minted that would tempt him back to the American trade. Others step in, but the price of incivility drove out one of the richest and most respected firms in Britain; a house whose name carries weight in every country of the world. While admiring American traits of candor and enthusiasm, such passages as the foregoing are debited in the estimate.

SCOTCH WORSTEDS.

BY THOMAS OLIVER, B. SC.
Principal of Galashiels Textile School, Scotland.

"Scotch worsteds." What does that mean? Is this not a contradiction of terms? It certainly seems anomalous! I thought worsteds were made in Bradford! Such ejaculations would doubtless be given vent by a man who was only acquainted with the Scotch trade in its inception or even with the trade of 20 or 30 years ago. But these halcyon days of monopoly have passed away; the average Scotch cloth of the present is no longer the old standard tweed set 37 inches in the loom, milled into 28 inches in the finished cloth, made of nothing but the very best woolen yarns, bright and even grotesque colorings; tall prices are no longer the chief characteristic. The modern cloth is, in short, anything that will sell, woolen or worsted, it matters not.

But it must not be thought that the change has been detrimental to the Scotch designers' innate taste for good coloring; quite contrary is the result. The Scotch cloths of 1902 are vastly superior in delicacy of taste in the arrangement of the coloring compared with the Scotch cloths of 1872. I expect to hear some one say rather incredulously, "Why is this?" Simply the stress of competition; an example of the good old adage, "Necessity is the mother of invention." Exactly the same circumstances that shape and give backbone to a nation also shape and give backbone to each individual unit in the nation.

Some years ago Scotch manufacturers and designers were rudely awakened by a dull trade to the fact that the glorious foliage of the old Scotch tweed tree was in the yellow leaf; they immediately bestirred themselves with a determination worthy of the best traditions of the famous Scots who upheld the honor of Scotland when the struggle was not merely for bread, but for national existence. They have elbowed their way into the incessantly jostling crowd catering for the public eye. They have carried themselves right bravely and successfully in the fray. Whereas "Scotch" a few years ago was assuming a forlorn aspect, at the present time Scotch cloths are conspicuously to the front.

The result is that at no former epoch in the history of the trade have the factories turned out so many miles of cloth per week. Notwithstanding the increased rate of production per loom, the demand for Scotch cloths is great enough to keep most of the mills busy, full and even overtime. People have found out that a good wearing article can be made as well if not better in Tweedsdale and Teviotdale as anywhere else in the world.

UNCLEAN WOOLEN GOODS.

BY ELMO.

THEIR EFFECT IN THE FINISHING ROOM.

It is doubtful if there is anything that is more detrimental to the interests and reputation of a woolen mill than goods not well cleaned.

It is not only that the goods are dirty that is objectionable, but the important fact that the finish cannot be perfect, nor can it be such as to do justice to the quality of the stock used.

In other words, if the cleansing of the goods

is not properly done, the other processes of the finishing which follow cannot be perfect, nor will the goods look or handle as well as they should.

It is sometimes the case that goods are returned to the mill as dirty, which were supposed to have been clean when they left the mill. It is not always easy to detect the trouble at the mill, but after the goods have laid for some time, especially if in the cases, they will become rancid from the impurities they contain, and come back to the mill to surprise the over confident finisher, who perhaps never dreamed that his work was defective.

The very fact that the finisher is thus likely to be deceived is the worst feature of the case. For the fact that the goods are not clean will cause trouble "all along the line" in the dry finishing, which he will try to correct where the effect appears instead of where the cause lies.

The successful finisher must study cause and effect in his department; and if he does, and is an apt scholar, he will learn that imperfect work in the fulling and scouring will produce a variety of difficulties in the dry finishing room and unfavorable reports from the market end of the business.

Putting the whole thing into a nutshell, we may say that a piece of cloth that is not thoroughly clean cannot be properly gigged, sheared nor pressed.

For a practical illustration, we will give a little experience of the writer in a mill that was running on a line of heavy weight cassimeres.

We were called to correct some difficulties that the finisher was having in his work, and were told that the goods did not seem to gig nor shear uniform, and that it was almost impossible to get out two pieces of the same style that would shade alike.

There was a large stock of finished cloth in the mill, and when asked why they did not ship them, we were told that they were "off shades."

They were ordered to ship them so that the pieces in each case would shade alike if possible, and in the stock on hand it was almost impossible to find two pieces that would shade alike.

One of the difficulties which the finisher seemed to be contending with, was an uneven finish "from side to centre." In other words, the sides of the goods would come up clear and bright, while the centres would not.

They had the appearance of being sheared down on the sides and not in the middle of the cloth.

The finisher had doctored his shear, ground, reground, set and reset, but the result was not changed.

He then concluded that the gigs were out of true, and turned his attention to them, but without avail.

When we looked over the work, we found the rolls on the rotary gigs were wound with strips of cloth along the middle, so as to force the teazles to clear up the goods at that point.

In order to shear the goods, they would run them until the sides were clear, and then with a girl on each side holding a sheet of paper over the cloth at the sides, to avoid shearing more at those points, the blades were lowered so as to shear the middle of the piece, all the time cursing someone for making the cloth with slack sides and selvages.

Every effort the finisher had put forth had been to adjust or readjust his machines in the dry finishing or gig room, without giving a thought to the possibility that the condition of the goods brought about by his own inability had anything to do with the trouble.

I first went to the fulling room and adjusted the strength and body of the soap to suit. Then started a set of pieces and followed them through to see that they received the treatment required. In the meantime we pulled off the extra laggings that had been wound on the gig rolls, while the finisher, who was still "on deck," swore it was a mistake, saying that if the goods would not clear up with the laggings, they certainly would not without.

Then we made corrections at the shears, straightening the rest and blades that had been doctored in the vain endeavor to do an impossibility.

When the goods came around they gigged and sheared as true and uniform as one could wish.

The trouble above referred to represented two extremes. First in dirty goods and sec-

ondly in ignorance of the requirements in the fulling and scouring.

When the wet finishing is skilfully and properly done the rest of the work is easy, otherwise impossible.

In this case the grease in the goods was never properly started and the fulling could not be uniform nor perfect.

The goods "worried up" instead of being fulled up, the time for the work thereby lengthened to the injury of the colors; and as some run a longer and some a shorter time, owing to the varying of the imperfect conditions, so the colors were varied in shade and the goods in uniformity of felt and finish.

When coming from the washer they were not clean, except on the sides, where they were more exposed to the action of the soap. For it will be found that, as a rule, dirty goods are the dirtiest in the middle, which explains the conditions in which the goods in question went to the dry finishing room.

After getting the work under way, we found no difficulty in matching the goods or in finishing uniformly.

The object of this article is to show what trouble may be occasioned by not knowing that the goods are dirty, and the importance of the initiatory work in the finishing room, upon all the other processes.

Aside from this, it is impossible to obtain a fine, soft and agreeable "feel" to the goods unless they are thoroughly clean.

To secure this result, the soap for fulling must be of sufficient strength to act upon the grease in the goods, with a saponifying effect, so that during the process there will in reality be no grease in the goods, it having been converted into soap. And at the same time there should not be an excess of alkali beyond what is required to accomplish this result. Otherwise it will be liable to act unfavorably upon the colors. The body of the soap should be sufficient to "hold up" and not run thin and watery during the fulling.

Goods thus treated can be easily washed, while on the other hand, if the fulling soap fails to do its part, the fulling tends to set the grease in the goods so that it is harder to remove.

The adjustment of the soap so as to have it exactly right, is a matter of prime importance, and should receive the finisher's most careful attention and earnest study.

VARNISH FOR COTTON MILL ROLLS.

BY SAUL.

The question is often asked, What ingredients shall we use in our varnish to enable us to keep a smooth, even surface on the cots, have them glossy enough so that the fluff from the cotton in process will not adhere to them, but give off freely on the clearer?

Some ask this question as though it was akin to How many times ten are there in a hundred? as though a correct answer should be readily given, whereas this question may be correctly answered in more than a dozen ways.

There are quite a number of substances from which to make the various kinds of varnish needed, all of which may give very good results. The principal ingredients, of course, are various kinds of glue, isinglass and other kinds of hard gums softened so as to be as pliable as the leather cots, and yet of such a nature that they will last and not crack, dissolve nor grind to powder.

The different kinds of leather also require a change in the ingredients. The fineness of the general texture of the leather used also needs to be observed; the rough, coarse grained leather will do better with a coarser body to fill up well the pores. The same varnish may not do as well for coarse goods where very long drafts are used, the finer goods needing a finer, smoother paste that simply lays on the surface. In the heavier leathers such as are used for drawing and slubbing frames, the make up from the raw skin often requires a different varnish than a leather got up by another firm using a different process and very often other kinds of currying preparations.

The various acids, oils or tallow, as well as the quantities used in their rapid preparation has much to do with the leather's absorbing moisture, and this must be considered in the selection of ingredients for and consistency of the varnish.

The main object in using a varnish is to keep an artificial face on the leather, equal to, if not better, than the original. We must

also aim to have our varnished face as near pliable as the original; if the varnished surface is too hard or too thick, we will have deeply fluted rolls; and if the varnish is too soft, yet dry enough not to stick, we will likewise have fluted rolls. Though there seems to be so many things to attend to to insure success, yet it is no mystery, nothing to do with any occult science, yet by not attending to some of these things in their proper time and place many a card and spinning room has been bunged up, especially in dry weather.

Some men complain that the varnish they use rolls the leather. Well, this may be so at times, but the rolling mostly occurs when the room has been too damp, and the temperature too low. Under these conditions it is difficult to keep the leather cots from absorbing moisture, and if too much acetic acid or its equivalent is put into the varnish as a dryer, the too moist leather cots will become somewhat like the burned upper of a shoe; when oil gets near them the nature of the leather is gone.

This is the reason for using red lead as a dryer, mixed with stewed raw hide, fish glue and isinglass. All acetic acid would be too strong and cause rotting, but by using part vinegar we get a good dryer. The whole will form a good coating for rolls in the preparatory processes.

For intermediate and fine speeder frame rolls, I would use 1/4 isinglass, 1/2 fish glue, 1/4 stewed raw hide, simmered in a glue kettle with good vinegar, to the consistency of cream. On mule work (30's to 60's), I would use 2/3 isinglass and 1/3 stewed rawhide with half and half acetic acid and vinegar, brought to the consistency of thin cream. I have found this very good for running mules over or very near a canal, or in or near a slasher room.

For fine work, say from 80's to 150's or finer, on mules or ring frames, I have used a varnish composed of 2/3 gum tragacanth, 1/3 gum arabic, brought to a skim milk consistency with 1/3 alcohol, 1/3 water and 1/3 vinegar. This may be used while the work is running. Clean the rolls well, squeeze out an old linen rag dipped in the solution, move it along the rolls gently, slowly, with not enough pressure to squeeze out too much at a time. A frame may be done in this way in five minutes, on mules, with a piece of rag in each hand; a yard may be done at each stretch and the coat applied twice a week with much profit.

The stewed rawhide should be cut in chips very small and stewed in an oven as you would a piece of meat, in a closed vessel or in a glue kettle. It will keep two weeks in a cool, dry place, but it is better to make it as needed. When we make any kind of varnish for cotton mill rolls, if we use any of the glues or isinglass for the base, we must mix some of the lighter gums for softeners so it will not be too brittle, but nothing in my experience equals rawhide, for it is pliable and never sticky.

JAPANESE SILKS.

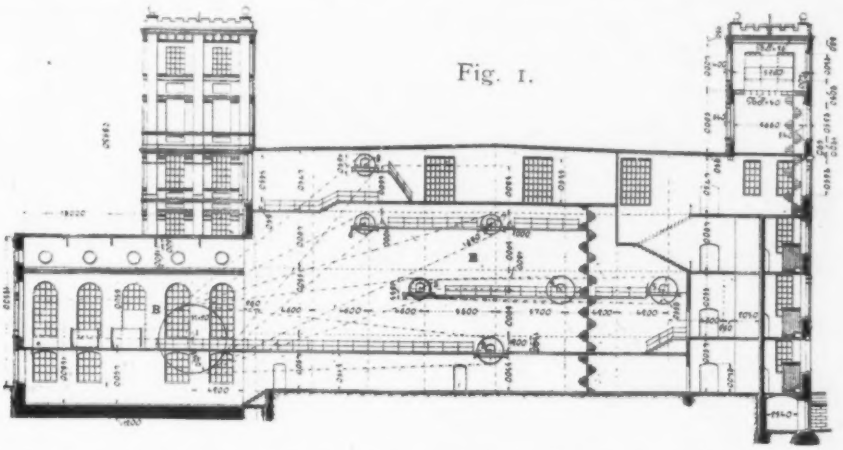
Our tariff, high as it is, is not high enough to prevent the active, able and imitative Jap from selling large quantities of Japanese silks in the American market. This trade is increasing to such an extent as to merit the serious attention of our manufacturers. For the nine months ending with March of this year the total of our silk imports was $29,015,548. Over 40 per cent. of this amount came from France and consisted of high priced goods. Japan's share was $3,160,061, and the significant feature is that in 1901 her exports of silk goods in the corresponding period amount to but $1,982,711. This shows a gain of nearly 60 per cent. in two years as a result of Japanese skill and cheap labor in making silk goods for our market. That wonderful people were introduced to civilization but fifty years ago, but in this time they have become an important factor that must be reckoned with. In England this Japanese competition is still more severely felt owing to the absence of tariff barriers. The impossibility of competing with Japanese silks has led some Macclesfield (Eng.) silk manufacturing firms to put in sewing machines with which to make the Japanese cloth into scarfs, handkerchiefs, etc. All of which goes to show that the Asiatic peril is by no means a creature of the fancy and that without the protection of a high tariff our domestic market, which is the best

market in the world, would become the prey of the foreign manufacturer employing cheap labor.

PLAN OF AN ITALIAN COTTON MILL.

The accompanying diagrams illustrate a cotton yarn mill recently built in Italy. Fig. 1 is a cross section of the mill showing the

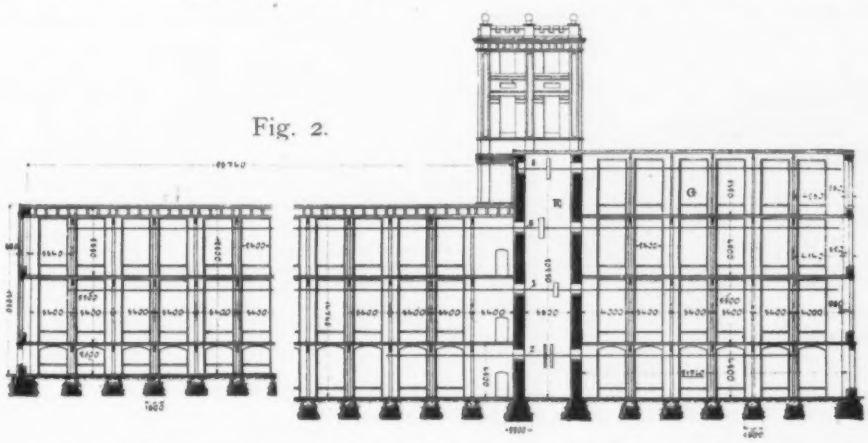
Fig. 1.



belt passage. From the plans, Figs. 2, 3, 4, and 5, it will be seen that the belt passage divides the mill into two unequal parts. The large part at the left consists of three stories; the smaller part at the right of four stories.

The mixing room which is on the second floor behind the boiler contains one bale breaker. The cotton is carried by a latticed apron to two self feeders from which it is blown to the opening room (D). The cotton bales are taken from the store room and carried by an elevator to the mixing room. In the picking room are one single and two double openers, a horizontal exhaust opener and nine pickers. The dust trunk is shown at (C). The picking room is located near the power house and but one story removed from the carding room; the laps are carried by an elevator to the second floor. Here there are

Fig. 2.



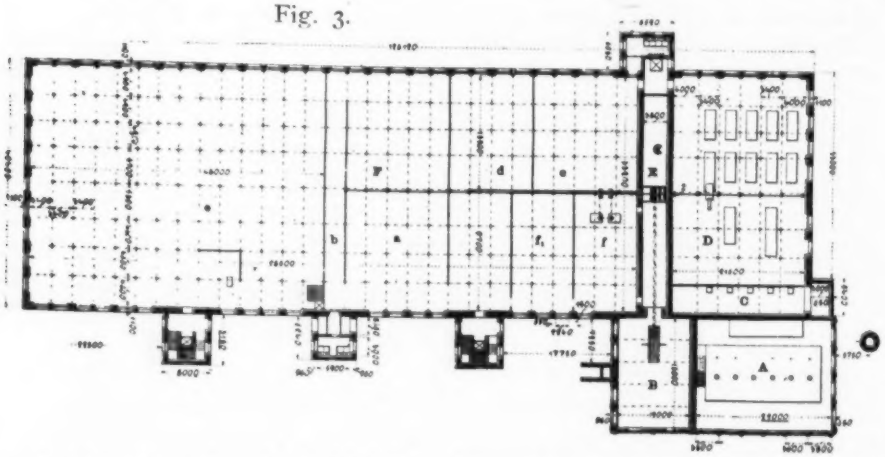
This arrangement is necessary in order to make the area of the preparatory rooms correspond with that of the spinning rooms, also to separate the preparatory processes in a fire proof building.

101 cards facing across the room and behind them are sixteen drawing frames, eight with three heads and eight with four heads each. There are sixteen roving frames, six with forty-two spindles each and ten with sixty-

four spindles each, making a total of 892 spindles.

The roving now goes to the fine speeders (e and a). The sliver and ribbon lap machines for preparing the stock for the comb-

Fig. 3.

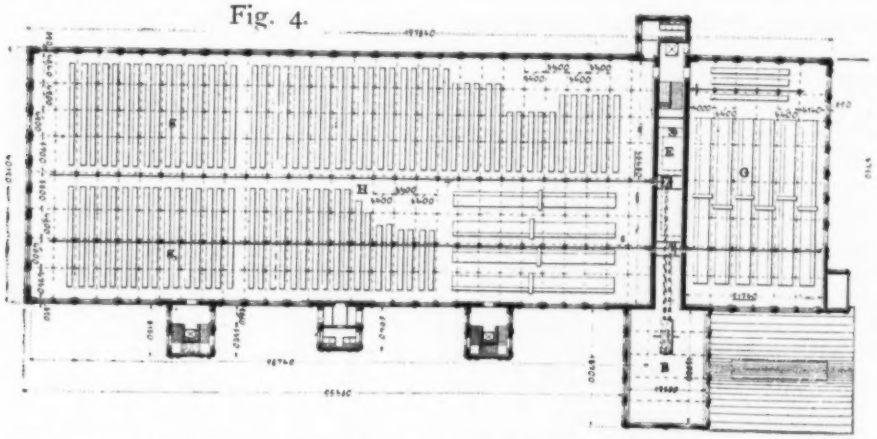


ers are placed in the right wing behind the mixing room. The two smaller are sliver lap and the three larger are ribbon lap machines. Next to these are placed eight combers, each with eight heads for ten and one-half inch laps. The roving now goes to the spinning rooms which are in the right and left wings

making a total of 13,440 mule spindles. There are twenty-six long and eight short ring spinning frames; the twenty-six long frames have 500 spindles each of two and three-eighths inch gauge; the eight short frames average 360 spindles each so that the total number of ring spindles is 15,880. There are thirty-five twisters with 424 spindles each, eleven twisters with 384 spindles each and five with 252 spindles each, making a total of 20,324 ring twister spindles.

In the spinning room (G) are four reels;

Fig. 4.



in the third story as well as in the fourth story of the right wing. The mules are shown at (G) and the ring frames at (g); a large number of ring twisters are at (gl).

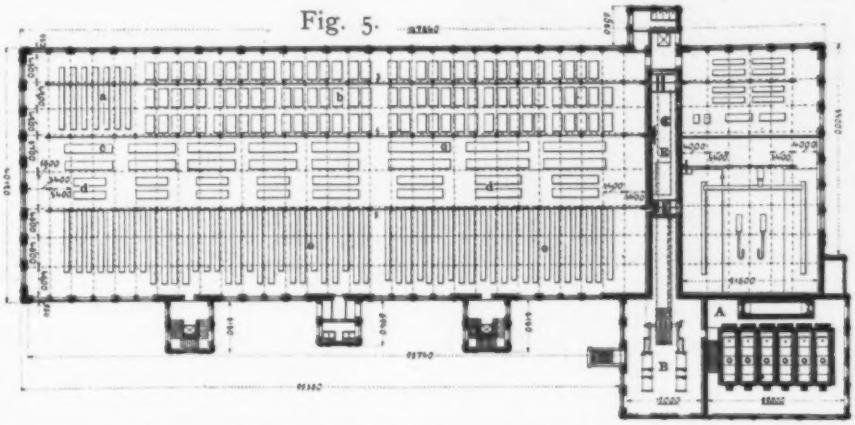
There are sixteen mules of one and one-eighth inch gauge, with 840 spindles each,

the spinning room is entirely separate from the preparatory processes. On account of the grade of the land the first floor of the left wing is built at two levels, and there is a cellar which is used for yarn storage. Next to this is the passageway (b), at the right of

which are the repair rooms (F and d). An adjacent room, Fig. 3, is used for cleaning and reworking waste. In the front of this story is the receiving room (a) where the yarn is received and tested; next to this is the office (fl), then the dynamo room (f).

Communication between the rooms is effected by stairways at the front of the building; there is a freight elevator in each stairway. Closets and water tanks are shown at Fig. 1. The circular staircase shown in the belt passageway is used by the oiler. The boiler house is shown at (A) and the engine room at (B); in the former are six boilers with heaters. From the engine room belts pass to the main mill through the belt corridor.

Fig. 5.



FINISHING WOOL AND MIXED FABRICS.

XXIV.

BY N. REISER.

(Copyright, 1903, by The Lord & Nagle Co.)

CHINCHILLA FINISH.

This finish is obtained by rubbing the napped cloth between two plates, the lower one being stationary, while the upper one is vibrated to produce the effect desired. Fig. 90 is a cross section of a chinchilla machine; (C) is the bed plate; (H) the upper plate; vibrated by the eccentric in the shaft (D); (J) is a lever for throwing the plates in or out of action.

The working surface of the bed plate is covered with plush or felt; that of the upper or vibrating plate with plush or rubber; this covering causes the plate to grip the cloth and rub the nap into the desired shape. The plates can be adjusted to bring the upper plate on the cloth with the pressure required.

The direction of the movement of the upper plate is regulated by an eccentric, and determines the character of the finish. A thick nap of fine fibres is essential for the production of a good chinchilla finish. Fig. 91 shows the finish obtained when the plate moves in a circle, that is, both sideways and lengthways. During this vibration the cloth

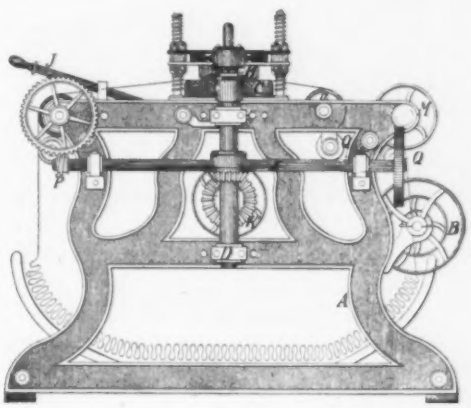


FIG. 90.

is carried forward slowly. Fig. 92 shows the effect of vibrating the chinchilla plate sideways only. The finish shown at Fig. 93 results from a backward and forward movement; Figs. 94 and 95 show twill effects made

by a diagonal movement of the plate. The plate is pressed firmly against the cloth during the process. Fig. 96 shows a chinchilla finish made with a lighter pressure and a wider vibration of the plate.

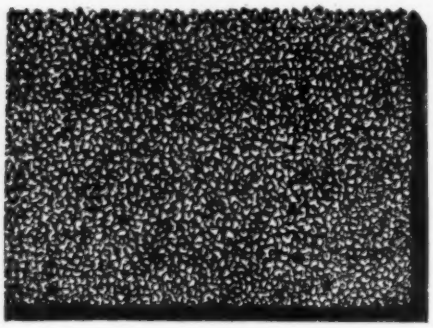


FIG. 91.

Circular effects have been produced by bringing revolving discs in contact with the cloth; these discs are attached to the lower ends of upright studs set in the upper plate and driven by bands running on whorls at the upper ends above the plate.

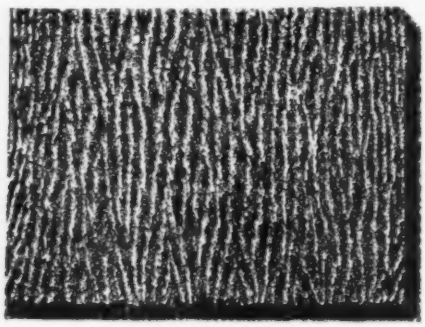


FIG. 92.

PATTERNS MADE IN SHEARING.

Making patterns on cloth in the shearing process requires a shear specially adapted for the purpose. This method of decorating fabrics has been in use about fifty years. The figures are produced by a toothed or figured blade or rest, by raising and lowering the blade or by the use of a stencil plate which leaves certain portions of the face of the cloth exposed to the action of the shear.

By the first named method the edge of the shear blade is either indented or dulled at certain intervals so that the nap will not be cut by these parts of the knife. The pattern is made during one passage of the cloth through the machine, as it is impossible to

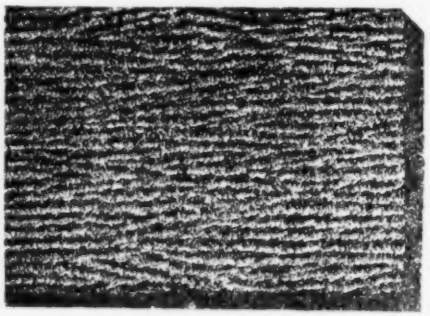


FIG. 93.

give the piece a second run and bring the cloth under exactly the same part of the blade. The cloth must move very slowly because the

FIG. 94.

knife is set deep into the nap to clear the bottom at one passage without tearing the fibres. Both shear blade and cloth must be free

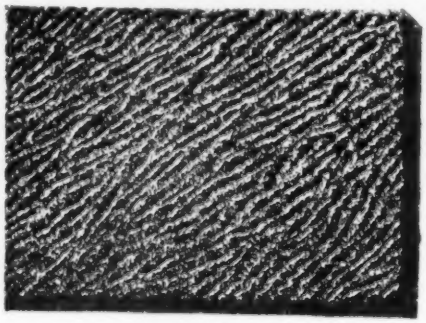


FIG. 95.

from any vibration sideways so that the notched places in the blade may be kept in line with the warp threads and not run first to

one side and then to the other, which would produce a wavy effect in the goods. When desired a wavy effect can be produced by vibrating the shear blade at regular intervals.

Patterns can also be made by indenting the rest, by which means the cloth is sheared only where it passes over the high places. Plaid effects can be obtained by first shearing the

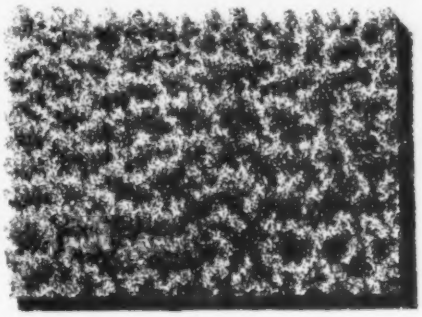


FIG. 96.

stripes as already described and then producing the cross bars by alternately raising and lowering the blade on a plain shear.

Patterns can be produced on the shear by the insertion of a thin stencil plate between the cloth and the blade. The stencil prevents the knife from being brought down low enough to clear out the bottom of the fabric; for this reason the nap should be as long as possible to give a good contrast between the unsheared and partially sheared portions of the face.

(To be continued.)

SPINNING WASTE SILK.

BY HENRI SILBERMANN.

The roving frame for silk waste, Fig. 50, is similar to that used for flax and worsted spinning. From seven to ten slivers are doubled and drawn out, the resulting strand receiving a slight twist to give the consistency required to hold it together and then wound on spools ready for the spinning frame proper.

The sliver is taken from cams, joined on the carrier roll (a), Fig. 51, first passed between the rolls (b) and then combed by the pins (c) through which they are drawn by the more rapidly moving delivery rolls (d). The roving is then threaded through the flyer (e) and after receiving a slight twist is wound on the bobbin or spool (f) ready for spinning.

The roving frames for different lengths of staple are built in the same general way; they differ from each other in the speed and the space between the receiving and delivery rolls; the number and length of the needles also varies with the size of the sliver. Formerly roving was wound soft on the spools,

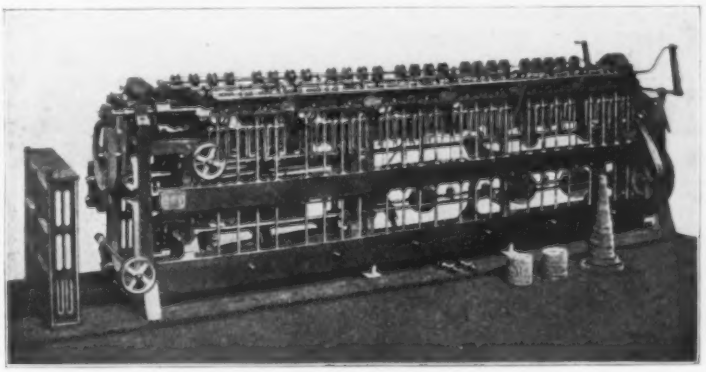


FIG. 50.

but now the pressure flyer is used by which a much greater quantity of roving can be wound on one spool. This results in much saving of time in spinning by avoiding changes of bobbins.

There are two kinds of spinning machines, mules and ring frames. Roving is spun ex-

clusively on flyer and ring frames, rings being used for fine and flyers for coarse yarn. The ring frame makes a more solid and

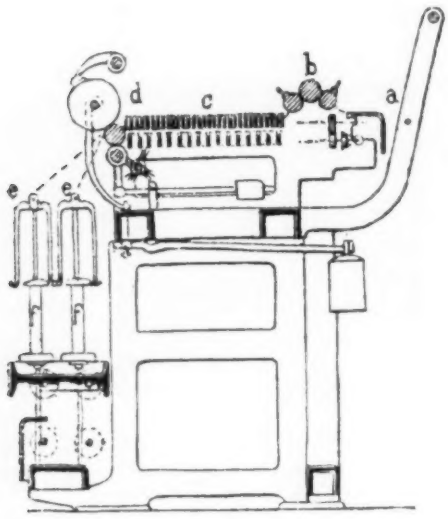


FIG. 51.

harder twisted thread than does the self actor. The ring frame in use at present is built with two parallel rows of vertical spindles one on each side of a long frame. Each row contains from 50 to 150 spindles, making from 100 to 300 spindles on each machine. The spools filled with roving are placed in one or two rows either in an upright or slightly inclined position at the top of the machine. The sliver is then carried downwards between three pairs of drawing rolls which draw out the strand and make it finer. The lower rolls are corrugated and fixed on a shaft that runs the whole length of the machine, while the pressure or top rolls are set in pairs. The front rolls are subjected to the highest pressure; the middle ones to the lowest. The spindles make from 3,000 to 3,500 turns.

The flyers are very light as compared with those used on a roving machine and are carried around by the tension of the thread. This tension is regulated by the friction caused by placing washers of leather or felt between the spindle and the plate. For flyer spinning a strong thread is necessary as the yarn must carry the spool which is dragging on the spindle. For this reason flyer spinning has been displaced to a large extent by the ring frame.

As florette silk is sorted into four or five varieties according to the length of the fibre, ring frames vary in the speed of the spindles and the diameter of the rolls. The distance between the drawing rolls is much less than in the previous machine. This distance must correspond to the length of the fibre. It is of great importance that the lowest carrier

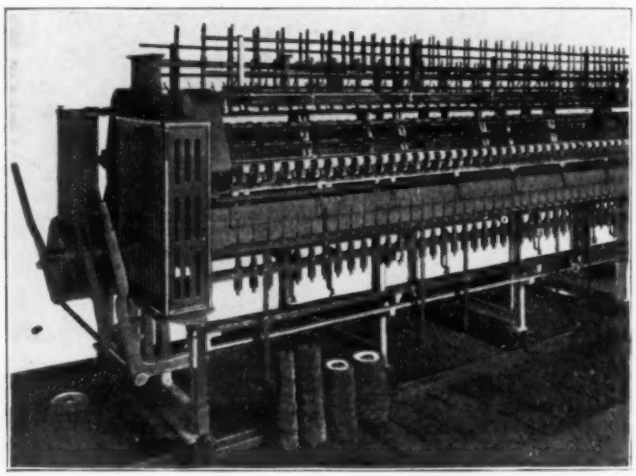


FIG. 52.

roll be placed at such a distance from the delivery roll as is suitable for the length of the fibre. This distance depends upon the

length of the shortest and not of the longest fibre. The distance between the receiving and delivery rolls is regulated by the length

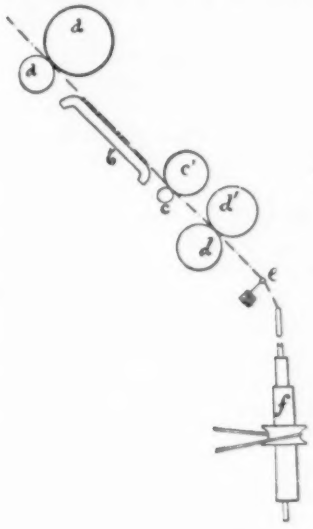


FIG. 53.

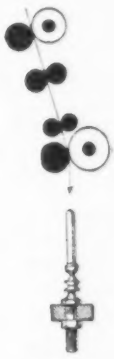


FIG. 54.

of the longest fibre and the distance between the lowest carrier roll and the delivery roll depends upon the length of the shortest fibre. If this is not carefully regulated, lumpy and twitty places will be caused in the yarn.

The draft in spinning waste silk varies according to the material from 27 to 8; the twist is regulated by the quality and size of the yarn and is determined only by observation and practice under varying conditions.

Fig. 52 shows a ring spinning frame for waste silk. A sectional plan of the rolls and spindle is shown at Figs. 53 and 54. The roving passes between the rolls (a), is supported by the plate (b) and then received by the small rolls (c) and delivered to the delivery rolls (d) which draw the roving to the desired size. The yarn then passes to the spindles (f) where it receives the necessary twist and is wound on spools. The ring frame for long silk fibre differs from that for short fibre in the number of carrier rolls between the receiving and delivery rolls. These delivery rolls are driven at a slightly increasing speed in order to keep the strand free from kinks. They are weighted with light wooden rolls so that they may support and carry the yarn forward instead of drawing it. As before stated, production of a uniform thread depends in great measure upon the adjustment of the draft and carrier rolls. The shorter the fibres the closer should the spindles be placed to the driving rolls in order that while the twist is going in the

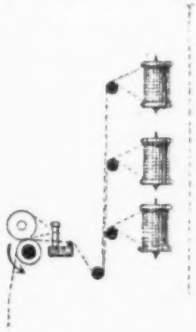


FIG. 55.

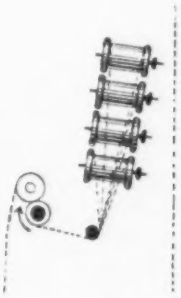


FIG. 56.

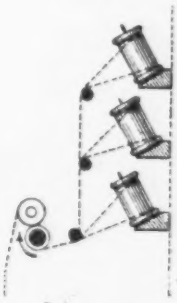


FIG. 57.

On account of the many different qualities of silk waste it is impossible to give any fixed rules for the adjustment of the rolls in spinning. An experienced spinner will soon find by close observation how to set the rolls. The distance between the rolls and spindles should also be adjusted to suit the length of the fibre,—the shorter the fibre the shorter this distance should be.

yarn may not be unduly stretched. For low stock in coarse numbers carrier rolls are used instead of the supporting plate. The spindles run about 5,300 turns a minute in medium yarn; for coarse numbers the speed is reduced to 4,000 or less.

A small proportion of silk yarn is used single, but the greater part of it is twisted after spinning. Most fine yarn is made 2-ply,

while the coarser grades, such as that used for hosiery or coarse sewing silk, are made 3 or 5-ply. The better grades are usually doubled before twisting, two threads being wound on one spool. In this way much time is saved in changing bobbins on the twister. As the spindle on the twister continues to run while the thread is being tied an imperfect place is caused which must be removed from the yarn later on. This doubling process is not essential, but gives good results in the saving of waste and the production of a uniform thread, especially on twisters without stop motions. The doubling machine winds the threads either in cylindrical form on two headed spools, in cylindrical form with conical ends on paper tubes without heads or finally on spools without heads by means of cross winding; these spools are then placed on the twister. The quality of the twisted yarn depends in great measure on the manner in which the doubled yarn is placed on the machine.

Figs. 55, 56 and 57 show three methods of supporting the spools on the twister. At Fig. 55 the spools stand upright, the ends passing over carrier rods and then through the rollers. At Fig. 56 the spools are supported on inclined pins, the ends being carried down together under the rod and passing between the rollers in a reverse direction from that at Fig. 55. Fig. 57 shows the method used for hard twisted yarn. Friction is created on the spools by pieces of felt placed under them. The ring frame is used for twisting silk; the flyer frame is used only for very heavy twist and for coarse hard twisted yarn. The ring frame spindles make from 4,000 to 5,000 turns per minute. Florette yarn used for weaving is always twisted to the left, while sewing silk is twisted to the right.

CHEAP LABOR IN THE FAR EAST.

The low wages in Asia and the consequent misery of the workers on that vast and overpopulated continent is generally admitted. Owing, however, to the fact that the products of this cheap labor do not come into direct and general competition with our own the full extent of the misery is but imperfectly understood. Occasionally a scare is started, generally on the Pacific coast, over the "yellow peril" and for a few days or may be weeks the daily press is filled with dire predictions of an avalanche of cheap Asiatic goods pouring over our tariff walls, destroying our home industries and upsetting our whole social system. The scare soon subsides owing to the absence of any material signs of the invasion and we relapse into our usual blissful optimism until another recurrence of the alarm. That there is ground for concern over the awakening of Asia is beyond question. There is today in Asia a population of, say, 800,000,000 whose workers are anxious to sell their labor for a mere pittance, 3, 10, 20 cents per day. A practical illustration of the difference between the American and Asiatic wage level has recently been supplied by the discussion in India over the use of the automatic loom.

Time need not be wasted on the proposi- advantages resulting from the use of automatic machinery. The incentive to save lessens as cost declines and when a commodity can be obtained free no one will try to save it. In the textile industry of America labor saving machinery is most valuable because it is here that labor costs the most. This high cost of labor has stimulated invention and given us those marvelous labor saving machines in the textile industry of which the automatic loom may be taken as a type.

The question of installing automatic looms has been raised in India lately, and the facts presented show that there wages are so low as practically to eliminate the desire on the part of the manufacturer to save it. An India weaver runs two looms. The daily product of these two looms is on an average 24 pounds of cloth, for which the miserable toiler receives one cent a pound or 24 cents.

This 24 cent level has various results. It means an inefficient worker whose vitality is reduced to the vanishing point. The work is badly done; the waste is enormous; the cloth full of imperfections. The employer can see no economy in buying machinery to save such labor. Such labor, of which the supply is inexhaustible, is not worth saving and so the automatic machine which is eagerly purchased in America has slight attractions for the Indian manufacturer.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

A GUIDE TO KNITTING.

V.

BY F. W. HERINGTON.

(Continued from March Textile World)

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At each revolution of the machine, or cylinder, the tuck stitches "A" change their position, see Fig. 3 on the fabric, 5 needles or stitches to the right or left of the previous group of three rows of tuck stitches.

To change the position of the tuck stitches after each revolution of the cylinder, 5 needles to the right or left, it is necessary that the number of needles in the cylinder should be divisible by 10 and leave a remainder of 5 needles.

The number of cuts in the tuck needle presses must be a multiple of 10, as there are 2 tuck and 8 plain, = 10 stitches to constitute the pattern.

If the number of needles in the cylinder were exactly divisible by 10, the tuck stitches would be under each other, which would make the fabric show a continuous vertical stripe of 2 tuck stitches and then a continuous vertical stripe of 8 plain stitches, repeated around the fabric .

If the number of needles in the cylinder were divisible by 10 with a remainder of 2 or 8 needles, which would be 2 more or 2 less, then the tuck stitches, as well as the plain stitches would show diagonally across the fabric, either to the right or left, according as to whether the remainder were 2 or 8 needles.

If 2 threads of different colors were used in this pattern, Fig. 20, the 6 tuck stitches under each other, would only show one color in small squares on the face of the fabric, while the plain stitches, between the tuck stitches, would show horizontal rows alternately of the two colors, or what is called a "pin stripe" on the face.

FIG. 32.

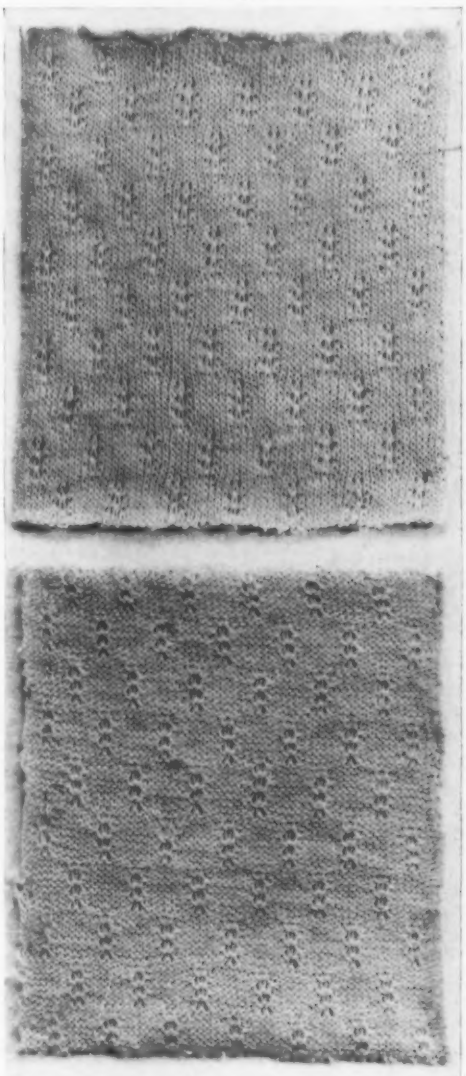


FIG. 33.

Fig. 32 is another illustration of tuck stitch combined with the plain stitch, as shown on

the face of the fabric, which is also used in men's fancy underwear.

Fig. 33 is an illustration on the back of same.

Fig. 34 is an enlarged sketch of the stitches, as shown on the back of Fig. 33.

This is another figured or lace effect, made on circular machines, using spring bearded needles.

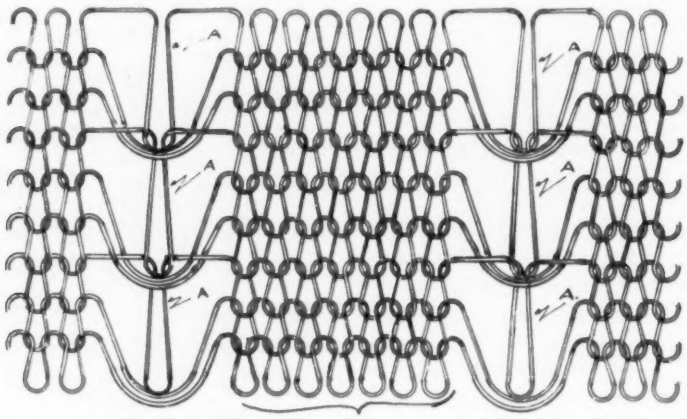


FIG. 34.

It is somewhat similar to Figs. 29, 30, 31, and made in almost the same manner.

The machine requires 9 feeds, 6 of which will have tuck needle pressers, and the other 3, plain needle pressers.

There will be two feeds following each other, each with a tuck needle presser, then the 3rd feed will be plain needle presser.

The 4th and 5th feeds will each have a tuck needle presser as also the 7th and 8th.

The 6th and 9th feeds will be the same as the 3rd. There is one tuck stitch, Fig. 34 A, and then 7 plain stitches, B, which are repeated.

The 6 tuck needle pressers will be cut alike, viz., cut so as not to press one needle, A, and then press the next 7 needles B, and repeat.

The tuck pressers are set so as not to press the one tuck needle, A.

The plain presser every 3rd feed, casting off the tuck stitches of the one needle A accumulated from the two previous feeds of tuck needle pressers.

At each revolution of the cylinder, the group of 3 rows of single tuck stitches, A A A, under each other, change their position on the fabric, 4 needles to the right or left, of the previous group.

To change this position of the group of tuck stitches, 4 needles to the right or left, it is necessary that the number of needles in the cylinder should be divisible by 8, with a remainder of 4 needles.

The number of cuts in the tuck needle pressers must be an exact multiple of 8, as the pattern consists of one tuck and 7 plain stitches = 8.

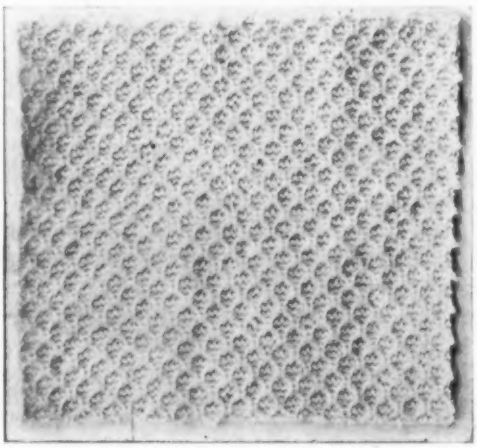


FIG. 35.

If the number of needles in the cylinder is divisible by 8 without any remainder, then the groups of 3 tuck stitches A A A will all be under each other, and show a vertical of single tuck stitches, and a vertical stripe of 7 plain stitches, which would be repeated all around the fabric.

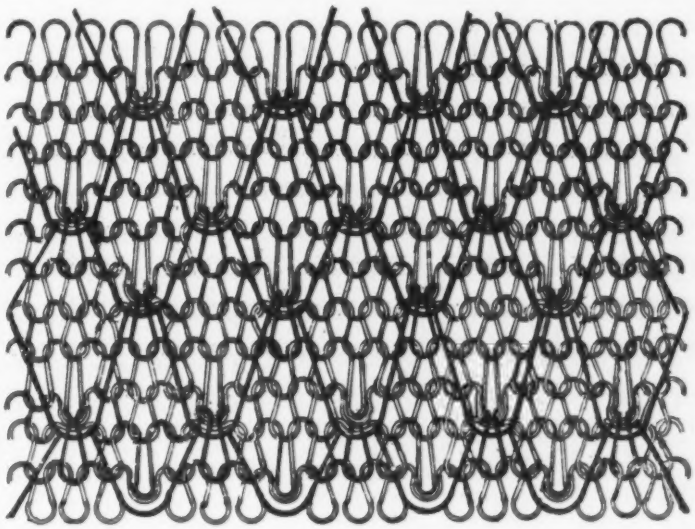


FIG. 36.

The same remarks apply to this pattern as to Fig. 29, as regards the number of needles, being divided by 8 and leaving a remainder of 2 or 6 needles, and also in reference to 2 different color threads being used.

Fig. 35 is another illustration of tuck stitch combined with the plain stitch. Fig. 36 an enlarged sketch of the stitches as shown in Fig. 35. It represents one of a number of patterns which are called "basket" patterns, because they have the appearance of a weave used in making baskets.

This is also made on circular machines using spring bearded needles.

The machine requires 4 or 8 feeds all with tuck needle pressers.

This is a pattern in which the plain needle pressers are not used to press or cast off the tuck stitches accumulated on the tuck needles.

The first 3 feeds will have the tuck needle pressers all cut alike. These must be cut so as not to press one needle and then to press the next 3 needles, that is to say, one tuck stitch followed by three plain stitches, repeated. All the 3-tuck needle pressers will be set so as to press the same "one" needle, with the result, that this "one" needle accumulates 3 tuck stitches on it, together with its previous loop of the plain stitch.

The 4th feed, also with a tuck needle presser, will be cut so as not to press 3 needles and then to press the next "one" needle.

This tuck presser being set so as to press the "one" needle, the other 3 tuck pressers did not press; it thus presses off the tuck stitches accumulated on the "one" needle and forms another plain loop.

In order to form the "basket" pattern, the position of the needle pressers, in relation to the needles, is changed at each revolution of the cylinder, 2 needles to the right or left, this is accomplished by having the number of needles in the cylinder divisible by 4 with a remainder of 2 needles.

If it is made with a machine having 8 feeds, the number of needles in the cylinder must be divisible by 4 without any remainder, the 5th feed being set 2 needles to the right or left of the "one" needle, the 6th and 7th feeds being set on the same "one" needle as the 5th and the 8th feed being set like the 4th feed; so that at each revolution of the

cylinder, the position of the tuck pressers is changed, the same as with the machine having 4 feeds.

To give the best effect to this pattern, a heavier or coarser thread should be used on the 4th and 8th feeds, which are the ones that have the tuck pressers, pressing "one" needle, and not pressing 3 needles.

In this pattern, what is knit as the back, becomes the face of the fabric, the "basket" pattern only being shown on the back as knitted, the reverse side showing plain stitches.

A very pretty effect is obtained in this pattern by using a thread of a different color on the 4th and 8th feeds, which is the one which forms the "diamond" or "basket" pattern.

Another color thread, or a white, being used for the other 3 feeds.

Fig. 37 is another enlarged sketch of stitches of tuck stitch combined with the plain stitch for a figured or lace effect, which can be produced automatically on seamless hosiery machines.

These are circular machines using latch needles, with only one set of needles, viz., the vertical or cylinder needles.

It is somewhat similar to Fig. 28, and made in the same manner.

A, represents the tuck stitches, B, the plain stitches, and C, the openings made by needles being left out.

Beginning at C, Fig. 37 shows one needle out, then A, one tuck stitch, then C, another needle out, then B, one plain stitch, then C, one needle out, then A, one tuck stitch, then C, one needle out, then B, 6 plain stitches, then A, one tuck stitch, then B, one plain stitch, then A, one tuck stitch, then B, 6 plain stitches are repeated = 22 spaces for needles, but only 18 stitches, as there are 4 needles out. To continue this pattern all around the hose, the cylinder would require to have a multiple of 22 needles, without any remainder, that is to say 88, 110 or 132.

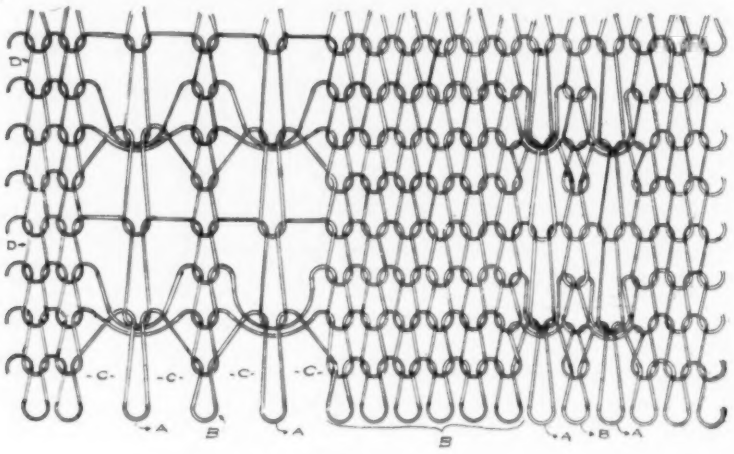


FIG. 37.

It will be seen that 2 tuck stitches are accumulated on the tuck needle, A, Fig. 37.

A cam, in the cam cylinder which operates the verticle needles, is provided, which holds the tuck needles, A, from casting off their loops, only at every 3rd revolution of the cylinder or thread guide. The vertical tuck needles are raised high enough, so that the thread which is fed to the other needles, lays across the tuck needles, which remain stationary, while the plain needles form 2 rows of stitches, thus laying two rows of thread, or two tuck stitches across the tuck needles.

At the 3rd revolution of the cylinder or thread guide, the tuck needle, with its previous loop, together with the 2 rows of thread across it, or the 2 tuck stitches, are cast off together, and a new loop formed.

This is followed by one row of plain stitches D, Fig. 37, on all the needles, the 2 tuck

stitches being repeated in the succeeding rows.

To produce the same pattern on circular machines with spring bearded needles, the machine would require 4 feeds, and the number of needles in the cylinder divisible by 22 without a remainder.

The 1st and 4th feeds would have plain needle pressers, and the 2nd and 3rd feeds, tuck needle pressers.

Where the needles require to be left out, this would be done the same as the latch needles, if the spring bearded needles were "trick" needles, but if leaded needles, they could either be broken off at the top of the lead, or left out of the mould when casting them.

The number of cuts in the tuck needle pressers, must also be a multiple of 22, and both cut alike.

Beginning at C, where the needle is out, this can be cut either to, or not to press, then not to press for A, then one cut for C, then cut to press one needle for B, then one cut for C, then not to press for A, then one cut for C, then to press for 6 plain stitches B, then not to press for tuck stitch A, then to press for one plain stitch B, then not to press for tuck stitch A, then to press for 6 plain stitches B = 22 cuts then repeat from the beginning.

(To be continued.)

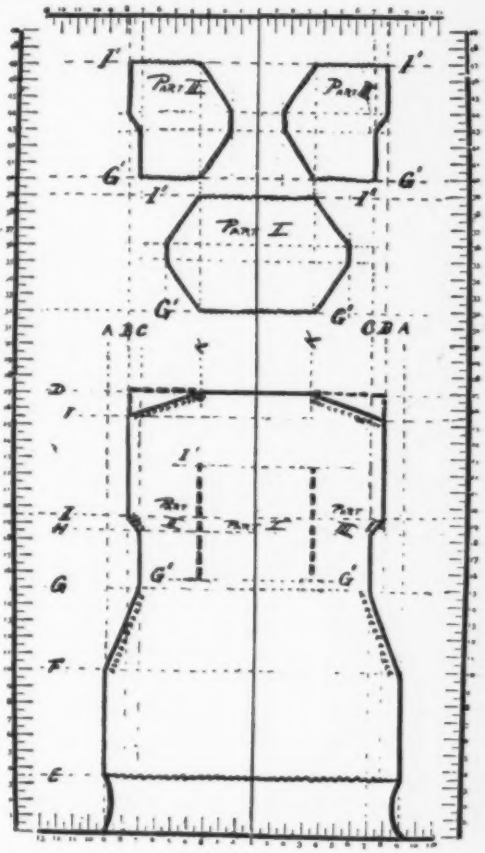
FORMING THE BODY OF A FULL FASHIONED VEST.

(From the Hosiery Trade Journal, England.)

In the making of full-fashioned underwear of all descriptions there are certain details which require special attention. Of these not the least important is the question of size. That is, what size should a garment be made to finish to the usual size; and, secondly, how to so proportion the article as to give it proper shape when finished, such shape to be a natural one and not one brought about during the finishing processes.

In making a lady's full-fashioned vest there are more details in the question of size and shape than in a straight garment, and it is to treat on the making of such garment that this article is written.

It will first be necessary to take the size of the garment to be made, taking such sizes as those when the garment is finished and ready for sale. Thus, a proportionate garment of this class would be, say:—



PLAN OF FULL FASHIONED VEST.

Width at chest.....31 in.
Width at waist.....28 in.
Normal width of skirt.....36 in.
Length from shoulder to end of skirt..27 in.

This garment will be made in two parts, the front and back, so that the width sizes will be half of those quoted, viz., 15 1/2 inches, 14 inches and 18 inches. These width sizes are marked on special design paper as shown in diagram at the vertical lines, A. B. and C. A being the skirt width set out at equal distance on each side of the centre line; B, the chest wdth; C, the waist width, similarly set out.

The question of length has next to be set

out. Line D representing the total length, 27 inches. This must now be subdivided into the various parts. Starting upwards, the rib bottom, which is usual for this class of article, takes up about 3 1/2 inches. Line E represents the length as shown. The skirt extends to line F, or a length of about 6 1/2 inches (6 1/2 + 3 1/2 = 10 inches). The shaping at the hip occupies another 5 inches, to line G (5 + 6 1/2 + 3 1/2 = 15 inches). The length of waist being 3 1/2 inches to line H (3 1/2 + 5 + 6 1/2 + 3 1/2 = 18 1/2 inches) and with one inch to line I for shaping under the arm makes the total length to this point 19 1/2 inches. The part from this point to the neck differs in the style of make in the back as compared with the front parts, the front being made 7 1/2 inches straight to line D, making the total of 27 inches long, but the back only 6 inches straight to line J and shaped 1 1/2 inches to line D, thus again making the length of 27 inches. The outer shape of back and front set out on these lines would then be made as shown in black lines, the line at shoulder J to K denoting the shaping at back and the line D being the straight line for the front.

The diagram now shows the exact outer shape of back and front of the garment in question. It is next necessary to know how these parts are to be made on the frame. This depends greatly on the class of yarn being used, for, as explained in a previous article, the three principal yarns—cotton, merino and wool—differ greatly in their shrinking capacity, and to test this it is the best to make a piece of fabric, have it finished, and test its exact shrinkage. Supposing that in the present case this has been done and the particular yarn used, which we will take as a wool yarn suitable to make a natural wool vest on a frame having some 19 needles in the space of three English inches, shows that the shrinkage from the frame in width equals 18 per cent., that is, that a fabric made on the needles 100 inches wide would, when finished, produce 82 inches in width of fabric. The length must be taken in two parts: first, the tension on the frame, and then the length to come off the frame, and the shrinkage from this latter in the finishing, whatever this may be, must be divided equally in the various parts as shown by lines E, F, G, H, I, J and D. This, varying as it does by different tensions on different machines, the length on machine also differs, but the shrinkage in finishing should always be the same in all cases so this could be ascertained, but in the former case only practical tests can get at the exact result. If, for example, in this special case, we take the total shrinkage from the length as measured in the frame during making to the finished dressed length to be about 20 per cent., we can then start to make the garment.

MAKING OF THE BACK PART OF THE GARMENT.

The garment in question being made from the bottom upwards, the rib bottom, which is made in a separate machine, must be run on, and, being required, 140 ribs would be put on 280 needles, or 140 on each side of the centre of each division. This 140 leads having been determined from practical tests that such a garment made on this width would produce the width required finished; this width would be retained for a length sufficient to give the 10 inches shown as finished length, then narrowing takes place during the length to produce another 5 inches of finished web to reduce from 18 inches to 14 inches or about 30 leads, 15 on each side; therefore, 15 narrowings each side properly distributed give the results required, and on this 110 leads is then worked sufficient length to give 3 1/2 inches when finished, and to fashion under the arms widening must be resorted to, say, 12 on each side, now making the width on the needles 122 leads or 244 needles. The straight piece from I to J is worked on this width, and a sharp reduction of the width is made during J and D to reduce to, say, 86 leads or 36 single needle narrowings each side. This completes the making of the back portion.

MAKING OF THE FRONT PART OF THE GARMENT.

As regards its outer shape it is the same as the back, except at the shoulder, which retains the width at I as far as the shoulder D, leaving off on the full complement of 122 leads. In this part, however, there is the breast gores to be considered, these may be made on several different principles, but, for an example, those having a centre seam are illustrated. The part of the front from G^1 to

I^1 has, in this case, to be made in two sections, which comprise the parts I., II. and III. At the line G^1 the total number of 110 leads would be divided into three parts. The centre part having 56 leads and each outside part 27 leads. The first section to be made we will take as being the centre or part I. During the making of this part the needle-loops on parts II. and III. are taken off the needles or out of knitting position, and in order to leave the needles clear for the making of part I., which for the length to produce 3-inch finish is widened on each side, say, for 16 leads or 32 single-needle widenings on the total width of 88 leads. A length to equal one inch is made and then narrowing takes place to the original width or 16 narrowings each side, thus finishing on 56 leads. These loops are now taken out of knitting position and the two side parts II. and III. on 27 leads are brought again into knitting position and widenings are made on the insides of each equal to those of part I. and narrowings the same. The shaping on the outer selvedge has also here to be considered. These parts being completed, the loops of part I. are brought again into position on the needles, making a complete row of loops, and this finish of the front part of the body is made as previously described.
article.

KNIT GOODS SITUATION.

The light weight underwear business for 1903 is now past history so far as trading by manufacturer or selling agent is concerned. Orders are nearly all filled, and the only goods offered for sale are small lots of seconds for which good prices are realized in most cases.

The season just passed has shown some very excellent values in men's low priced flat goods to retail at 25c., both in balbriggans and in colors. A line made by the Gilbert Manufacturing Co. in a variety of colored stripes at $1.85 has been well distributed among the large operators. There was a scarcity of good value in men's plain ecru ribbed goods at this price, but the Capron Knitting Co. made a line of colors in lace stitch ribs at $1.90 which sold well. The Blood Knitting Co. made a line of plain colored ribbed goods at $2.00 which was sold up very early in the season, and the Canasawacta Knitting Co. made a similar line of lower grade yarn with double seated drawers at $1.85.

The season has also shown a good demand for higher grade goods than former years, and it only requires that retailers show good goods in order to sell them. Trash is not wanted to any extent, and what little surplus there is in the market is in the low end of the line. Balbriggans are in good demand, and anyone who has a stock on hand has no difficulty in getting an advance of from 12 1/2 to 37 1/2c. per dozen. There will probably be a call for ladies' shaped ribbed goods made on the fine stitch for Spring, 1904. One or two manufacturers made them this season with high neck, either long or short sleeves, and lace trimmed pants to match, at $2.00 per dozen.

The Avalon Knitwear Co. is very busy on fine stitch goods in heavy weights for Fall, and report that they took very little business on tuck stitches. They have introduced a new feature on their goods this season in a cuff of which we present herewith an illustration in Fig. 1.

In the months of March and April it was talked about that the coming Fall would be the worst on record in the matter of late deliveries, but we learn from conversation with several manufacturers that notwithstanding the difficulties they have had to contend with many of them are further advanced on their orders than at this time last year. They state that this is due somewhat to the fact that the larger buyers placed orders very early for practically the entire season's needs. This caused the manufacturer to get to work earlier than if orders had been placed as in other years, viz., early orders for from two-thirds to three-quarters of their needs, and duplicates in March, April and May.

A new feature of the fleeced goods business is the demand from the British Isles. The first exports were made three years ago, but we are informed that the present season finds orders placed for over 2,000 cases, and there is also a call for the low priced ribbed goods for export. Our attention was called

a few days ago to a very light weight fleeced garment in a line of colors copied from a garment made in Italy. The price of this was about $2.25 per dozen, and the manufacturer states that he is shipping a great many to Australia and New Zealand. This new demand with the decrease in the number of mills making fleeces has the effect of making them scarcer and higher priced.

We are informed that L. E. Harrower is now accepting business on his standard weight cotton fleeces for October delivery at $3.50, the same goods that were sold early at $3.25.

The selling season for Fall goods just past has presented an opportunity for a lesson to one class of manufacturers. We refer to those who make too low prices on their merchandise in order to sell up their production quickly; those who figure a fair profit are as well sold up as the others, and are in a better position to surmount the difficulties of this season which are here in the shape of increased costs of yarn, trimming, labor, etc.

Lines for Spring are not yet shown, and manufacturers are not anxious to be first in the field. Some of them are so uncertain in regard to Spring business that they will endeavor to run as late as possible on Fall weights, preferring to turn out heavy goods on a very small margin rather than try to do a light weight business on which no margin is in sight, at prices buyers are inquiring for.

The men's balbriggans to job at $2.25 and $4.25 offer the hardest propositions, and the indications are that the former will weigh about 4 1/4 to 4 1/2 pounds, while the combed Egyptian to sell at 50c. will probably be made of stained American cotton. This staining process is now so well done that it is scarcely to be distinguished from the Egyptian by the trade, and is only found out by the consumer who finds that he wears out two garments instead of one as formerly. The only price that manufacturers can quote now would be based on the present costs of yarn, which would put them out of the range of popular prices, and as it is realized that goods must be sold at certain figures it follows that weights and qualities must be changed.

HOSIERY.

Lines so far shown for 1904 show only a very slight advance on some numbers and none on others. We believe that some lines of ladies' goods heretofore made of combed Egyptian yarn will now be made of combed peeler, but the general average will not differ greatly. Popular prices will be maintained, and in some cases will mean slightly smaller

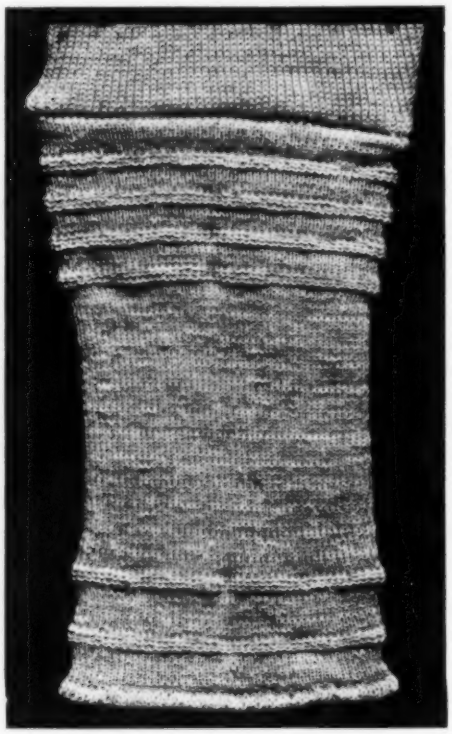


FIG. 1.

margins for the manufacturers. New lines of children's goods shown this season are full seamless lace front lisles and silk stripes, silk heels and toes to sell for 25c.

It is hoped that domestic manufacturers will make an earnest effort to deliver more perfect goods next season than some we were privileged to examine a few days ago; there was a case each of ladies' plain and lace goods costing $2.00 and in which nearly 17 per cent. were seconds, and yet the buyer had called the manufacturer's attention to the matter and had been told that they were as near

right as any manufacturer could make them, and that the buyer was too particular. If the domestic manufacturers follow this one's method to any extent, we shall soon see buyers asking for goods with "Made in Germany" on the labels.

Conditions in Chemnitz are not much changed from those at time of our last issue. A greater number of buyers are there than have been for years, and while there are plenty of buyers they are not placing large orders. Manufacturers have about used up all yarns owned on old contracts, and at the advance asked on new ones are not in a position to name any prices sufficiently low to induce any volume of business. Notwithstanding this fact, there are some special lines that are sold up to next January. In split sole goods there are none to be had, as manufacturers of them are sold up.

There is also considerable demand for gauze cottons and lisles, and the manufacturer who will take orders now on these lines is doing the buyer a favor. Printed and extracted goods are called for liberally, and even stripes are picking up some. However, the principal demand is for jacquards.

In better goods, hand-embroidered in flower designs or narrow clocks are much sought after, and also fine gauze lisles with lace insertions. Lace hose are quiet, and only a few for immediate delivery are being bought. Some patterns that formerly sold at M.13/— are now to be had as low as M.8/50. Lace 1/2 hose are practically dead, and several stock lots are in the market. Dark Oxford mixtures in jacquard patterns are in good demand.

SMALL TUBULAR GOODS.

A machine, invented by an English hosiery manufacturer, has recently been patented in the United States and is designed for small tubular work, such as laces, cords, etc. It appears that much trouble is experienced when knitting fine or glazed yarn on the machines now in use, by reason of the sudden jars or strains on the yarn causing frequent breakage. It is claimed that the new machine remedies this difficulty.

Figure 1 is an elevation. Fig. 2 is a central section of the needle-cylinder and yarn-feeders to a slightly larger scale. Fig. 3 shows to a larger scale the guides for delivering the threads to the needles. Fig. 4 is an end view showing a three-armed friction-spring acting on the spool or "beam" on which the threads are wound. Fig. 5 is a plan of the spring-tension fingers for putting a yielding tension on the yarn. Fig. 6 shows the latch-ring and the arm carrying the same. Figs. 7 and 8 are respectively an edge view

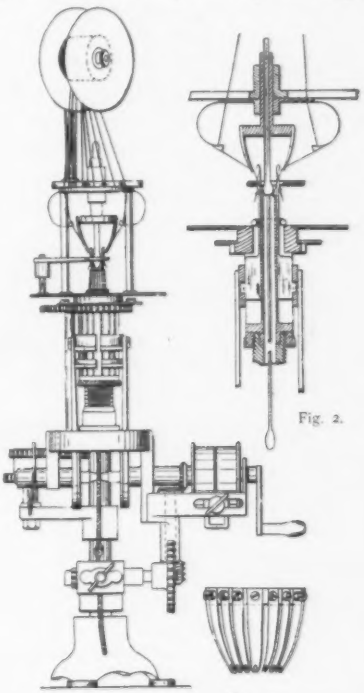


Fig. 2.

Fig. 1. Fig. 3.

and an inner side view showing one of the yielding spring-tension fingers. Fig. 9 is a perspective view of the arrangement for giving an intermittent step-by-step motion to the parts. Figs. 10 to 13 show the knitting action.

The action is as follows: As the shaft revolves the cams drive the collars up and down. Thus all the needles rise simultaneously and form a complete course at a single operation. In doing this each needle rises from the position shown in Fig. 10 through the loop last formed, and at the same time the guides move around one step to stretch the next thread in front of the needle. (See

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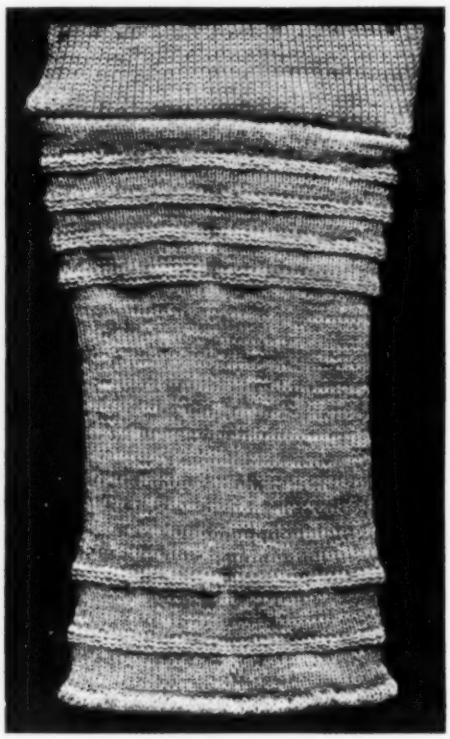

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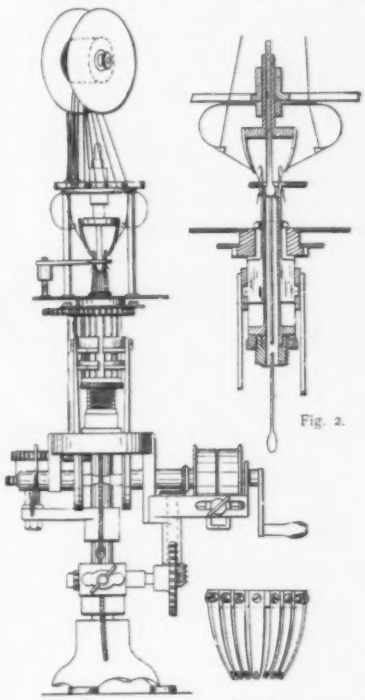

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Fig. 11.) Then the needles descend and knit in the ordinary way, Figs. 12 and 13.

The guides, together with the platform and the parts mounted thereon, move under the action of the wing on the disk; but while the knitting is actually taking place they are at rest, as only the plain part of the disk is in engagement with the wheel. Should any undue tension come on one of the threads, its spring-finger immediately yields and assumes the inner dotted position, Fig. 7, thus relieving such strain instantly.

The normal position of the fingers is that shown in full lines, the outer dotted position being that assumed when taking up slack. The work as produced is drawn down by the take-up arrangement and passes thence into a basket or the like in the usual way.

Manufacturing Hosiery.

Editor Textile World Record:

What size cylinder and number of needles are generally used for knitting men's and women's hosiery in fine and medium grades? What does it generally cost to dye and box hosiery for market?

Knitter (341).

For fine goods either 176 or 196 needles and a 3 1/2 inch cylinder for 10 and 9 1/2 inch men's hose, and 184 or 208 needles and a 3 3/4 inch cylinder for 11 and 10 1/2 inch hose. For women's fine goods, 208 needles and a 3 3/4 inch cylinder.

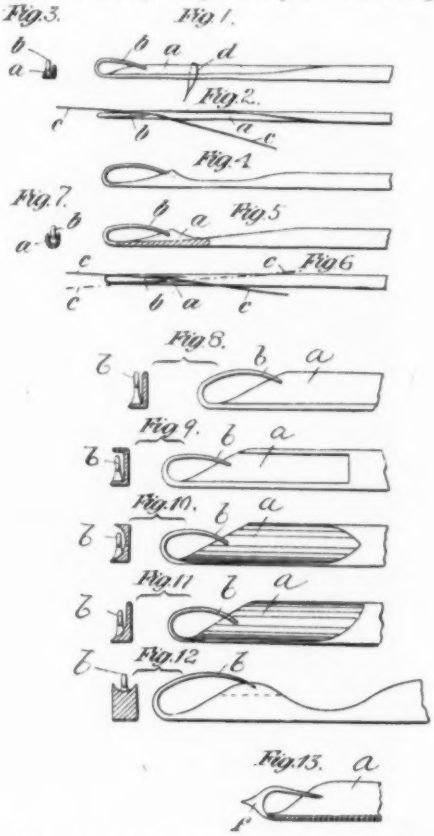
For medium goods 148 needles and a 3 3/4 inch cylinder, or 160 needles and a 4 inch cylinder for men's hose; the latter size would also do for medium grades in women's hose.

The dyeing of black hosiery costs from 4 to 7 cents per pound of goods, the cost per dozen being figured by the weight per dozen of the goods. The cost of finishing after dyeing, including boxing, costs from 8 to 12 cents per dozen, exclusive of the cost for fixed mill expenses.

RECENT KNITTING PATENTS.

NEEDLE FOR KNITTING. 726,758. Friedrich Bernhard Reuther, Geyer, Germany.

Hitherto in order to form the stitches in crocheting, knitting, working, embroidering, and stitching machines and the like in addition to tongue needles only simple hook needles were employed having an open hook, which had to be depressed in order to allow the stitches to slide off over the hook. The depressing device for this purpose took up considerable space, was deleterious to the machine and also made the employment of many other devices quite impossible. The same drawbacks are found with tongue needles and tubular needles. In the former case it is the tongues and in the latter the movable parts for covering the points of the hooks which require space for their movements, thus preventing the use of other appliances. In the drawings, Fig. 1 is a side view of one form of this invention. Fig. 2 is a plan view of Fig. 1; and Fig. 3 is a transverse section of Fig. 2, taken just in front of the point of the hook. Fig. 4 is a side view of a modified form of needle. Fig. 5 is a similar view, partly broken away. Fig. 6 is a plan view of Fig. 5,



and Fig. 7 is a cross-sectional view of Fig. 5. Figs. 8, 9, 10, 11 and 12 are views showing in elevation and transverse section various modifications of the invention. Fig. 13 is a sectional view of a further modification. By the present invention a hook needle is produced which removes the objections stated. It is characterized by the hook being made to enter a recess in the needle shank, and thereby not requiring to be depressed, and also by the needle shank being of such a form that it still allows the thread to be slipped under the hook, the thread entering near the point of the hook into a recess in the needle shank and being thus enabled to slip under the hook. The recess in the needle shank, together with the point of the hook which lies therein, may either be arranged at one side of the needle or in the centre or middle of the same, in which latter case the thread may be slipped in

from both sides of the hook. The thread is slipped under the hook by first laying it in a direction lengthwise of the needle, passing it down along the side and then under the point of the hook.

HOSIERY. 726,300. Nellie F. Hurdel, New York, N. Y.

This invention has for its object to provide a satisfactory means of refooting and patching worn stockings, and consists in making the foot and leg

Fig. 1.

Fig. 2.

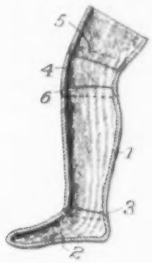


Fig. 3.

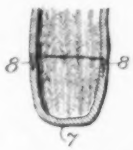


Fig. 4.

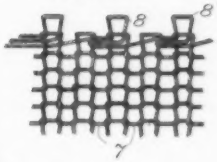
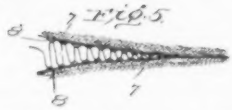
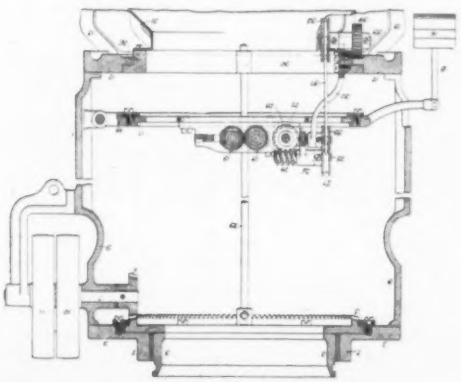


Fig. 5.



portions separable and in providing a separable patch for the knee, whereby the foot and patch may be replaced without the loss and expense of making a new leg.

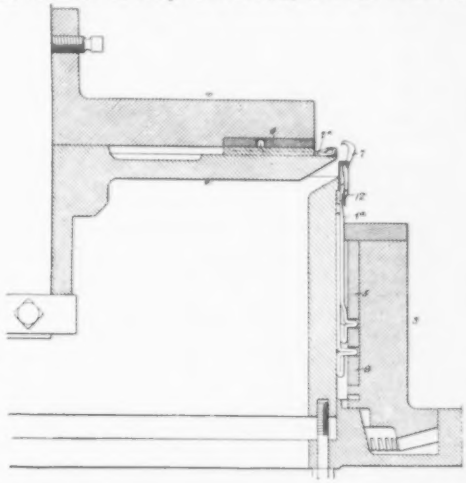
KNITTING MACHINE. Take-Up Mechanism. 727,465. L. N. D. Williams, Ashbourne, Pa., and Robert W. Scott, Philadelphia, Pa.



This invention comprises a construction whereby the desired results are attained without any rotation of the vertically-movable frame which carries the take-up rolls. In this machine the vertical frame is hung or otherwise mounted upon the fixed frame of the machine and is accessible at all times to the attendant, who can test the degree of tension which is being imparted to the work or can readily increase or diminish such tension without stopping or in any way interfering with the continuous operation of the machine.

KNITTING MACHINE. 727,522. L. N. D. Williams, Ashbourne, Pa., assignor of one-half to Robert W. Scott, Philadelphia, Pa.

The object of this invention is to so construct a knitting machine as to provide fine-gage grooves or guides for the needles, hooks, or other yarn-engaging elements at the edge of the needle carrier where the stitches or loops are drawn, without the neces-



sity of providing grooves of like fine gage for the guidance of the stem or shanks of the needles or hooks. When it is used in connection with a machine for producing fabrics having a fleecing yarn inserted therein, it permits of the use of the same cam carrier for both the needle-operating cams and for those which operate the hooks which engage the fleecing yarn.

KNITTING MACHINE. Electric Stop Motion. 727,429. Arthur L. Patterson, Albemarle, N. C.

KNITTING MILL NEWS.

New Mills.

*Alabama, Sycamore. The Sycamore Knitting Mills have been organized with capital stock of $10,000, to build plant for manufacturing underwear. W. R. Schreme (Utica, N. Y.) is president; J. E. Goodrich (Little Falls, N. Y.) vice-president; D. E. Lewis (Sycamore) treasurer and W. B. Callahan (Utica, N. Y.) secretary.

*Mississippi, Tupelo. The new mill to be established here by the Ely & Walker Dry Goods Co.

will be known as the Topsy Hosiery Mills. Mr. Henry Spang will be in charge of same.

*New Hampshire, Laconia. The Frank P. Holt Mfg. Co. has been incorporated with a capital stock of $2,500, to operate the hosiery mill previously reported to be managed at this place by Frank P. Holt.

*New York, Cohoes. The Reliance Sweater Co. will start operations in about a month, making sweaters. John H. Boyce is president and agent of the company; James H. Shine, treasurer, and D. G. McLaren, superintendent. Goods will be sold direct.

*New York, Fort Hunter. The building for the knitting mill to be operated by E. H. Key has not yet been completed. He will make fine worsted gloves, mittens and pattern wool sweaters.

North Carolina, Raleigh. The Blackmon Coble Hosiery Co. has been incorporated recently by W. C. L. Blackmon, J. M. Coble and E. S. Parker, Jr. The capital stock is placed at $15,000.

Ontario, Walkerton. J. Henderson, S. W. Vogan, and D. Traill of this place are interested in the Walkerton Hosiery Co., recently incorporated with capital stock of $40,000. They propose manufacturing hosiery, gloves, etc.

Pennsylvania, Mohns Store. The Electric Hosiery Co., a new concern, will start operations about the 18th inst., making hosiery. A new building is under construction. They will use steam power.

*Pennsylvania, Philadelphia. A. J. Martin is superintendent of the Hutton Manufacturing Company, recently incorporated, for manufacturing bathing suits, eiderdown, sweaters and golf vests. They operate 14 knitting machines. Goods are sold direct. Plant is located at 20 Strawberry Street.

Pennsylvania, Philadelphia. The Glen Knitting Co. is a new concern operating a plant at Trenton Ave. and Sargent Street, making full fashioned hosiery, lace and embroidered novelties. The capital stock is placed at $100,000. Thomas E. Brown is president of the company; Leonard M. Addis, treasurer, and Wm. S. Ash, secretary. They operate 250 knitting and 20 sewing machines, using steam power. Dye house is attached to the plant.

Pennsylvania, Philadelphia. Operations have recently begun by the Arlington Knitting Mills, making cotton, woolen and silk underwear. They occupy the third floor of building, N. E. corner Mascher and Turner Streets.

*Pennsylvania, Reamstown. Operations will be started about July 1st by the Lesher-Raig Knitting Co., Ltd. They will make misses' and children's ribbed underwear, operating 10 machines. Alfred J. Raig is president of the company and Pierce Lesher, treasurer. A new building is under construction.

*Pennsylvania, Somerset. Operations have begun in the knitting mill established here by Fink & Emert. They make men's, women's and children's hosiery, all wool and worsted, operating 11 knitting machines, using steam power. Will sell goods direct. They contemplate increasing if business proves successful.

*Pennsylvania, Waymart. The Waymart Knitting Company has been recently organized to operate a knitting plant here. L. B. Guckenberger is manager of the plant, and F. S. Stephenson, secretary and treasurer. The building will be 75 by 36 feet, two stories and basement. Sweaters, cardigan jackets, etc., will be made.

Tennessee, Morristown. A knitting mill is to be erected here by G. A. Russell and J. B. McCord.

*Tennessee, Sweetwater. Contract has been let and work started on construction of the new building for the Sweetwater Hosiery Mills, recently reported incorporated.

*Utah, Logan. The Union Knitting Mills have been incorporated with capital stock of $25,000. A. G. Barber is president of the company; D. C. Budge, vice-president, and H. C. Hansen, secretary and treasurer.

Enlargements and Improvements.

Georgia, Grantville. The Grantville Hosiery Mills have let contract for the erection of an addition, 48 by 56 feet, one story. They will install additional machinery.

Massachusetts, Pittsfield. The Musgrove Knitting Company has installed 10 additional knitting machines and one sewing machine in the mill.

*Massachusetts, Shelburne Falls. The Orange Knitting Co. is now operating 50 knitting machines at this place. They are installing additional ones, and will have a total of 75 soon running. Their plant at Farley is equipped with 35 machines. Make gloves, mittens, wristers, toques, etc.

Massachusetts, Shelburne Mills. The Farley Knitting Mills have installed fifty additional machines in the plant. They contemplate putting in 50 more before end of the year.

Massachusetts, Springfield. The Medlicott-Morgan Co. is equipping their mill with an electric plant. A new water wheel has been put in for running same.

Michigan, Rochester. The Western Kniting Mills, making lumbermen's socks, gloves and mittens, have installed some machines for making fine gauge goods.

New York, Hagaman. An addition is to be built to the Star Hosiery Mills, L. E. Harrower, proprietor.

New York, Utica. The Utica Knitting Company is installing two new sets of 60 inch cards.

Ontario, Dunnville. F. R. Lalor is president of the Monarch Knitting Company, which has been in operation for the past three months. J. A. Burns is secretary and treasurer of the company and John Slingsby, superintendent. The capital stock is placed at $26,000. They make fine worsted sweaters, ladies' vests and half hose. A dye house is attached to the plant. They contemplate building a plant especially adapted for their needs.

Pennsylvania, New Bloomfield. The hosiery mill at this place has been secured by Harry E. Clouser and W. H. Darlington, and will put same

in operation at once. They will install new machinery. This probably refers to the C. M. Romberger mill.

Pennsylvania, Reading. Kuersten & Rick have installed additional knitting machines in the plant.

Pennsylvania, York. The York Knitting Mills have recently installed 25 full automatic seamless knitting machines, 7 ribbers and 16 embroidery machines. Plans are being prepared for an addition to be built to the mill.

South Carolina, Manning. Twenty new knitting machines are being installed in the Manning Hosiery Mills.

South Carolina, Newberry. The Newberry Knitting Mills are to increase the capital stock of $25,000 to $40, 000, for purpose of making improvements to the plant, now equipped with 75 knitting machines. L. W. Floyd is president of the concern.

Mills Starting Up.

*Connecticut, Norfolk. The Norfolk & New Brunswick Hosiery Company's mill at this place, which has been idle for the past two years, is to be put in operation again July 1st. B. Darrow is local agent for the company.

*New York, Phoenix Mills. The Fennimore Knitting Mills have been incorporated with capital stock of $100,000, by John F. Carroll, W. O. and Richard I. Brewster, of New York. John P. Doane will be general superintendent of the plant. Operations will soon be resumed.

*Tennessee, Madisonville. Operations have begun in the Madisonville Knitting Mills. Plans have already been made for increasing capacity of the plant.

Mills Shutting Down.

New York, Carthage. Howard & Buck, operating the Riverside Mills, have dissolved partnership. The plant is to be closed and machinery sold.

New York, Cohoes. Operations are to be suspended for an indefinite time in the Globe Knitting Mills. The stock is being run out in the different departments and when completed, mill will be shut down.

FACTS AND GOSSIP.

Georgia, Camilla. A $20,000 knitting mill is reported as contemplated here.

Indiana, Hartford City. T. W. Sharpe of this place has some thought of starting a knitting mill for the manufacture of hosiery or underwear. He has not yet decided, and is first desirous of associating with him some one with a practical knowledge of the business.

*Maryland, Salisbury. The Blue Ridge Knitting Company, of Hagerstown, advise us that they have have not yet decided upon any location for a branch mill.

Michigan, Saginaw. The New "K" Knitting Co. is operating a plant at 808 Genessee Avenue, making hosiery, mittens, polish boots and all kinds of knitted goods, making a specialty of infants' knit goods.

New York, Boonville. The Boonville Knitting Co. is undecided about the erection of a new building. They are now finishing up stock.

*New York, New Berlin. We have been advised by J. J. Connell, of the Tremont & Suffolk Mills (Lowell), that he will assist in forming new company for the knitting mill project and undoubtedly be a stockholder, but further than that he will not be interested.

PERSONALS.

Knit.

Henry Spang, St. Louis, Mo., has been engaged to manage the Topsy Hosiery Mills, owned by the Ely & Walker Dry Goods Co.

James Keeler has recently succeeded John Lutton as overseer of carding at H. E. Bradford & Co.'s mill, Bennington, Vt.

George H. Davis of Raritan, N. H., has taken charge of night carding for the New Britain Knitting Co., New Britain, Conn.

John W. Alpin has resigned as superintendent of the McCallum Hosiery Mill, Northampton, Mass., and will take charge of a large mill making the same goods in New Jersey.

Robert Cochran, late of Norwich, Conn., has gone to Schuylkill Haven, Pa., to take the position of bleacher for the Union Knitting Mill.

William Ashdon has resigned as overseer of carding at the Wright Health Underwear Co., Pownal, Vt. George Hudson, of Little Falls, N. Y., has succeeded him.

Henry Damp, late of Amsterdam, N. Y., has secured the position of latch needle knitter with the Standard Knitting Mills, Knoxville, Tenn.

Deaths.

D. Scullen, superintendent of the Commercial Knitting Mills, Troy, N. Y., has resigned.

Edwin R. Handy, president of the Contrexville Manufacturing Company, Manville, R. I., died May 1st. Mr. Handy was born at Wappinger's Falls, N. Y. He went to Manville a number of years ago and the present Contrexville Manufacturing Company was started under the name of Russell Handy & Sons. When the elder Mr. Handy died, the company was incorporated under the present name, and the deceased became president of the company. A widow and four children survive him.

Thomas F. Brennan has been appointed superintendent of carding, picking and garnetting for the Victor Knitting Mills Company, Cohoes, N. Y.

James Keeler, overseer of carding for the Hope Knitting Company, Cohoes, N. Y., resigned last week in order to accept a similar position under his brother, Daniel B. Keeler, superintendent of the knitting mill of H. E. Bradford & Co., Bennington, Vt.. Mr. Keeler was succeeded at the Hope Knitting Company by David Keefe, who resigned from the employ of the Victor Knitting Mills Company.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Pulley and Gear Forcer. Bamford and Smith, Pascoag, R. I., are putting out an improved and very convenient form of forcer for removing pulleys and gears from shafting. A description of this device will be found in another part of this issue.

Automatic Shuttle Changing Attachment. The Asala Co., 1 Green St., New York City, have placed on the market an automatic shuttle changing attachment which can be seen in operation at their works, 129th St. and Park Ave. They state that the automatic attachment can be applied to any modern loom for cotton, silk or worsted. Broken picks are prevented and the shuttle is changed just before the filling runs out regardless of the exact position of the shuttle in the box. The speed of the loom is not affected and the device is so simple as to require no more than ordinary care. It increases the number of looms that can be operated by one weaver, thus enabling him to earn more wages at a lower price per yard. The filling waste is less than when the shuttles are changed by hand.

Fries Dyeing Machine. John W. Fries, Winston-Salem, N. C., is introducing an improved form of his well known dyeing machine, the principles of which were explained in the May issue of the Textile World Record.

Centrifugal Dyeing Machine. A. Klipstein & Co., 122 Pearl St., New York City, have secured the agency for the United States and Canada for a centrifugal dyeing machine. This machine was invented in Germany and first described in this country in the Textile World in July, 1902; a more detailed description appeared in the May, 1903, issue of the Textile World Record.

Vacuum Dyeing Machine. The Vacuum Dyeing Co., Chattanooga, Tenn., are placing on the market a patented machine for dyeing textile materials in a vacuum. It is claimed that great economy of labor is effected and very uniform results obtained. It operates on the circulating system, the circulation being maintained by a centrifugal pump.

Hopper Bale Opener. The Howard and Bullough American Machine Co. are placing on the market an improved hopper bale opener which is described in another part of this issue.

Guard for Hydro-Extractors. The Johnston Novelty and Mills Specialty Co., Utica, N. Y., have brought out a guard for protecting workmen from accident when working hydro-extractors. A description appears in another part of this issue.

Hopper for Northrop Loom. The Draper Co., Hopedale, Mass., have changed the hinged support for the butt end of the hopper in the bobbin to prevent breakage. An exhaustive test has shown that with a strengthened casting and the insertion of a leather washer to prevent the blow of metal on metal the difficulty of breakage is entirely overcome.

Twister Spindle. The Draper Co., Hopedale, Mass., have made a change in the construction of their twister spindle to prevent loosening and leakage of oil. The pins which locked the step and bolster were apt to loosen and leak oil if the step or bolster was jammed down on them with the slots out of line. They now furnish a construction in which no pins are used at all so that leaky bases are a thing of the past. The bolster is locked in the case by a long key holding in a slot, and the step is held in place by a spring connection which can be easily changed in position for adjustment of the bearing fit. The spring has no function as such while the spindle is running.

Grip for Mule Scroll Bands. John Hetherington & Sons, Manchester, England, are applying to their mules a new device for attaching the band to the mule scroll. It consists of a bracket, carrying two wedge-shaped segments between which the band is fastened. The inner surfaces of the wedges are grooved to fit the strands of the band. It is claimed that the new method of fastening the band is much superior to the old one by reason of the short time required to apply the band and also because of the saving of waste. The band need not project more than one inch beyond the wedge.

Moire Attachment for Looms. William Boelling, Barmen, Germany, has devised a method of producing moire effects in cloth during the weaving process, a brief description of which appears in another part of this issue.

THE LANE STEEL-FRAME CANVAS BASKET.

About ten years ago W. T. Lane & Bro., until recently at Port Chester, New York, but whose removal to Poughkeepsie is noted in another part of this issue, invented and began the manufacture of canvas steel-frame

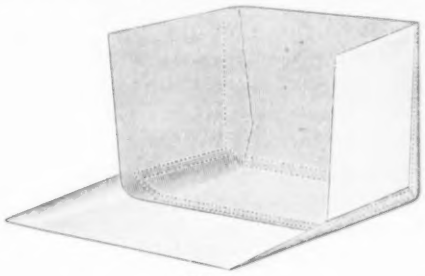


FIG. 1.

baskets. Owing to their great durability they are now widely used, especially for handling coal, which requires a basket of great strength to stand the racket. This branch of their business has been extended so that they now have a large share of the coal bag and basket trade. Baskets are subjected to nearly as severe handling in a mill as in the coal business and for this reason the Lane basket will commend itself to textile manufacturers generally.

Fig. 1 shows a sectional view of an unfinished body part of the Lane basket. It is made of first quality extra heavy duck of great strength and is perfectly smooth inside. The bottom and lower edges, which receive the greatest wear, are of double thickness and

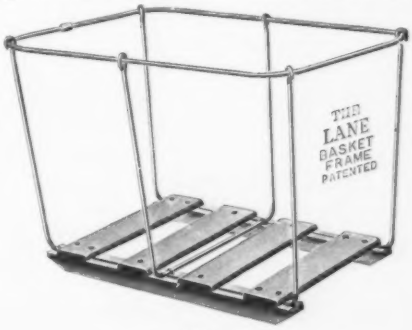


FIG. 2.

when each part is in its proper place, enclosures or pockets are formed through which the upright parts pass.

At Fig. 2 is shown the Lane basket frame. Experience has shown that a strong, springy, resilient and durable frame for a canvas basket requires the use of a certain grade of steel and a construction without welds or rigid joints. The Lane basket frame is made of

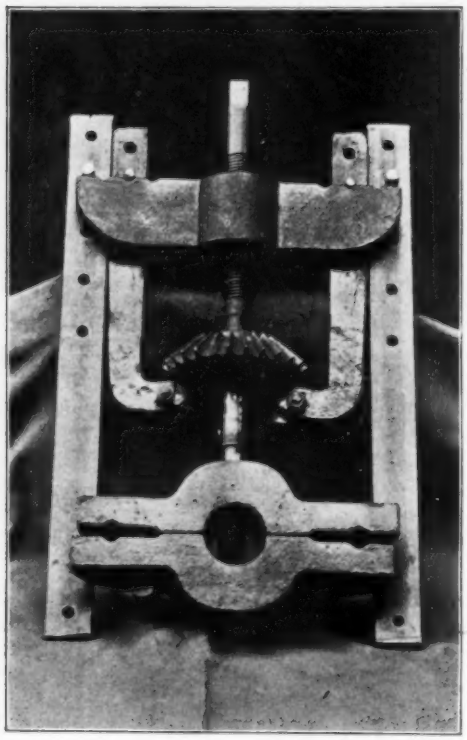
FIG. 3.

specially-drawn, round, springy steel put together with flexible eye joints, shown at Fig. 3. It is claimed that the basket is unbreakable and indestructible with ordinary wear. The eye joint is a feature peculiar to this basket and to its great strength and flexible nature the success of the Lane basket is largely due.

Spindle Oiling Device. T. E. Leigh, 23 Grange Ave., Heaton Chapel, Manchester, England is putting on the market an oiler for ring spindles. A number of spindles have been equipped with this oiler and operated for a considerable time with very satisfactory results.

PULLEY AND GEAR FORCER.

The trouble and expense resulting from the removal of gears and pulleys that have become stuck on the shafting is well known to every mill mechanic and overseer. A pulley and gear forcer is an almost indispensable adjunct to every well-equipped mill, and the accompanying illustration shows a machine of this kind recently brought out by Bamford & Smith, Pascoag, R. I., manufacturers of the Bamford dust-proof and self-lubricating spindle tube. The illustration represents the forcer in a position to remove the horizontal jack gear on a Knowles loom. A collar rests



A PULLEY AND GEAR FORCER.

on the shaft to hold the two dogs in place while the end of the screw comes in contact with the end of the shaft. The long dogs are used when the pulley is some distance from the end of the shaft.

This device is very handy when the set screws have become imbedded in the shafting and broken off. It has a capacity of 40,000 pounds and is made of the very best material throughout. It costs $8.00. Further information can be obtained from the builders.

A NEW AUTOMATIC SHUTTLE-CHANGING ATTACHMENT.

FOR WORSTED, COTTON AND SILK LOOMS.

The accompanying illustration shows a cotton loom equipped with a new automatic shuttle-changing attachment, which is built by the Asala Company, 1 Greene St., New York City. This shuttle-changing attachment it is stated, has been subjected to thorough tests with very satisfactory results on woolen, cotton and silk fabrics. It is, we believe, the first automatic shuttle changer offered in this country for the weaving of worsted and silk, as well as cotton, goods. The other automatic looms have been confined to weaving cotton only; the success in this branch has stimulated inventors, the Asala being the first to claim the attention of our manufacturers.

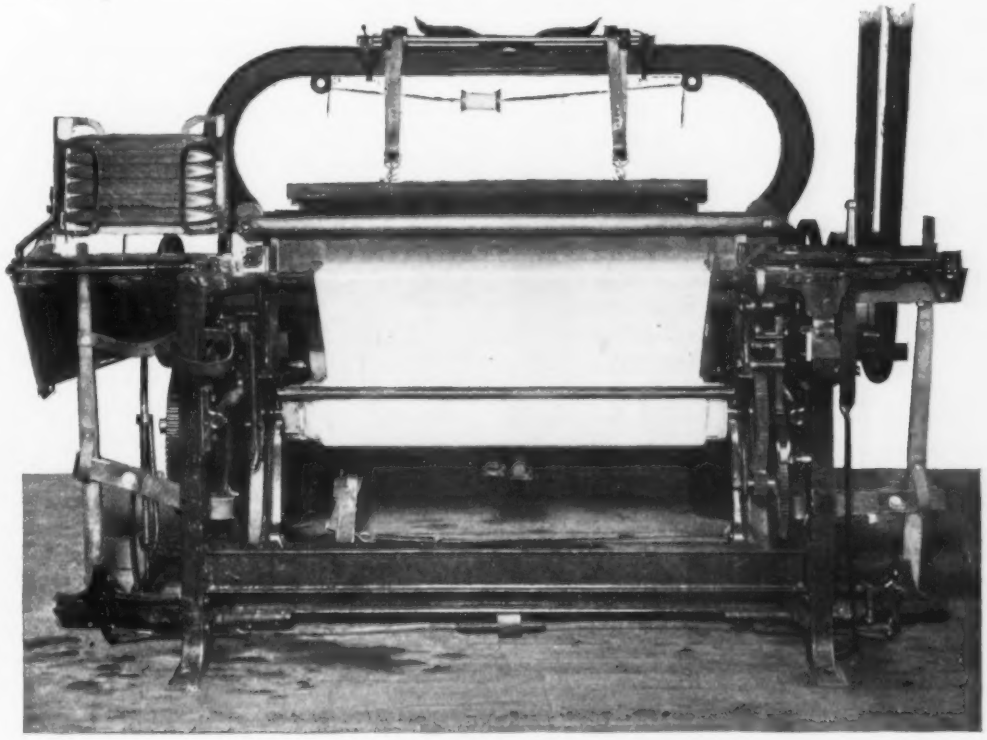
The automatic shuttle-changing attachment can be applied to any underpick loom. The advantages of a self-shuttling attachment for woolen and worsted goods needs no demonstration to practical weavers. On good work and fine yarn the loss of production occasioned by stoppage of the loom during working hours, amounts to from 20 to 30 per cent. of the theoretical production, based on a continuous operation of the machine. On fabrics made with coarse filling yarn, such as Irish friezes, the loss of production sometimes runs as high as 35 or even 40 per cent., depending upon the length of the filling bobbin and the width of the goods.

This loss is due in great part to the stopping of the loom in changing shuttles. There is, of course, more or less loss from stopping for tying ends, changing warps, fixing, etc., but it may be safely stated that with an automatic shuttle-changing device the shrinkage from the theoretical production will be reduced at least one-half. In addition to the large loss of time with the present method of hand changing shuttles there is an additional disadvantage of a higher percentage of weav-

er's waste caused by the removal of the shuttle before the filling on the bobbin is used up.

It is stated that the Asala automatic shuttling loom attachment enables the quantity of yarn left on the bobbin when the shuttle is changed to be reduced to a minimum. This is one of the great advantages claimed for it, and a short calculation is sufficient to demonstrate what a great saving such a device would be. Take, for example, a 60-loom mill running on a medium grade of worsted cloth. Assuming that 1,200 pounds of cloth are woven per day and allowing 5 per cent. for weaver's waste, we would have 60 pounds of waste per day. If woven into cloth this is worth 75 cents per pound; in the form of waste it is worth 25 cents per pound. The difference of 60 pounds per day would amount to 9,000 pounds per year. It is not claimed that the Asala device will save all of this waste, but the large loss due to the present wasteful hand methods shows that a reduction of the waste to one-half of the present quantity would prove an important economy in the operation of our mills.

Another feature which will be greatly appreciated by all manufacturers is the absence of misspicks in goods woven with this device. Many automatic weaving devices, while satisfactory in other respects, have proved valueless in practice, owing to their causing misspicks in the goods. The Asala Company state that the most thorough test shows that their loom is not open to this objection. It is also claimed that the looms with this attachment run at exactly the same speed as without it, which is a very essential point.



A LOOM EQUIPPED WITH THE ASALA AUTOMATIC SHUTTLE CHANGING ATTACHMENT.

The device consists of three principal parts: 1, a double receiver at one end of the lay; 2, a magazine which holds from five to eight or more shuttles and which serves as a distributor; 3, an arrangement which regulates the amount of filling left on the bobbin.

The automatic shuttle-changing device enables a weaver to attend to more looms and therefore earn higher wages at a lower rate

per yard. The builders state that the device requires no more than the ordinary care given to other parts of the loom, and that the attachment can be applied at a low cost to plain or fancy looms of any width.

Cotton, worsted and silk looms equipped with this device are in operation at the works at 129th St. and Park Ave., New York, where they may be seen by any one interested upon previous application to the office at 1 Greene St. The company will soon be ready to offer their own looms equipped with the automatic attachment. They are now supplying the attachment for other makes of looms and inform us that numerous orders have already been received from some of our largest cotton, woolen and silk mills. Further information can be obtained by application at the office of the Asala Company, 1 Greene St., New York City.

HEATING AND VENTILATING A COTTON MILL.

The Hope Mills Mfg. Co., of Hope Mills, N. C., has equipped its mills throughout with the "hot-blast" system of heating and ventilation. All steam-coils are concentrated in a heater in the basement through which the air is drawn by a fan and distributed to the several rooms through galvanized iron piping and brick flues. The fan is driven by a direct-connected horizontal engine which exhausts into a section of the heater. The remainder of the heater is of such capacity that, using exhaust steam from the mill engines, the buildings can be heated to a temperature of 70 degrees F. when the temperature is 10 degrees above zero out-of-doors.

The finishing building and the weave shop each contain two stories, and in addition, provision has been made for furnishing enough heat to the first story of the storehouse to prevent the freezing of the automatic sprinkler apparatus for fire protection, while the second story is to be heated to 70 degrees F.

The guarantees are based upon the use of fresh outside air, although when warming up in the morning the air may be drawn from the interior, thus saving a considerable amount of steam. Live steam at 90 lbs. pressure is to be used at night, but, as stated above, the pipe capacity of the heater is sufficient to permit the use of exhaust steam from the power-plant of the mill in the daytime. The entire equipment has been designed and installed by the B. F. Sturtevant Co., of Boston.

Improved Noble Comb for Worsted. Messrs. Taylor, Wadsworth & Co., Midland Junction Foundry, Leeds, England (Stoddard, Haserick, Richards Co., American agents), were the first builders of the Noble comb and since then have made these machines for every part of the world. They are now bringing out a new comb which embodies many new features which their experience has shown to be desirable.

The small circles instead of being placed around the pillar are now placed to one side, enabling them to be easily removed when necessary. With the old method of construction the removal of the small circles required from one and one-half to two hours; with the new construction this work can be done in five and one-half minutes according to tests recently made in Bradford. The bolts fit in slots and holes so that they can be easily removed by loosening the nuts without taking them from the bolts. The noil box is placed inside the circle; this brings the highest knife on the outside and working among the finest row of teeth.

The machine sets on a solid bed plate; this removes the objections of the old combs which rested on legs that were likely to get out of place and twist the machine. Only 12 joints are necessary instead of the 32 in the old type of machine. The dabbing motion is run by a slanting instead of upright belt. This enables the brush to be driven with a slacker belt and removes much of the possibility of slipping. The carriage rotates on ball bearings.

The machine is heated by a loose steam chest held by springs. This removes much of the trouble of unequal expansion when the steam chest is cast with the frame. The machine is equipped with the automatic adjusting drawing-off rollers which have been on the old comb for two years past. An air blast is provided as a substitute for the ordinary

stroker. This air blast has been used on silk combing machines for a long time, but this is its first application to worsted combs. It is said to give good results for Botany or cross-bred wools.

THE EVANS' DRY PIPE VALVE.

The accompanying illustrations show the dry pipe valve of the International Sprinkler Company. Such a device must be simple and positive in operation. A sprinkler head might fail to do its duty at the required time and thereby create a little loss, but if a dry pipe valve (controlling anywhere from 200 to 500 sprinkler heads) failed to properly open at the outbreak of fire, the effectiveness of the entire sprinkler system is absolutely destroyed, and the whole structure is consequently left to the mercy of the rapidly spreading flames. Mr. Evans, in designing his dry valve, worked along an entirely new line of thought, and the machine as now made is the first one ever produced that complies absolutely with all of the requirements of the fire protection experts. It is the re-

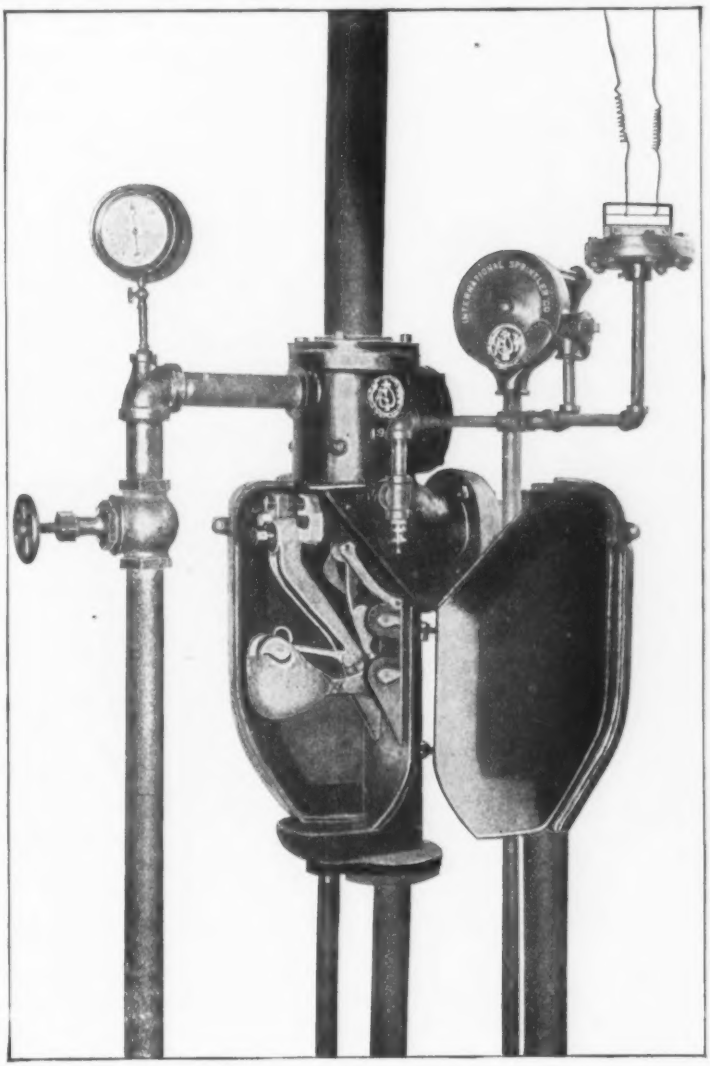


FIG. I.

sult of nine distinct developments produced from the drawing right through to its completion in the machine shop.

Fig. 1, shows the parts exposed with the valve "set dry," as it is called, that is with the air on the system. Fig. 2, shows the valve "set wet," that is with the water on the pipes.

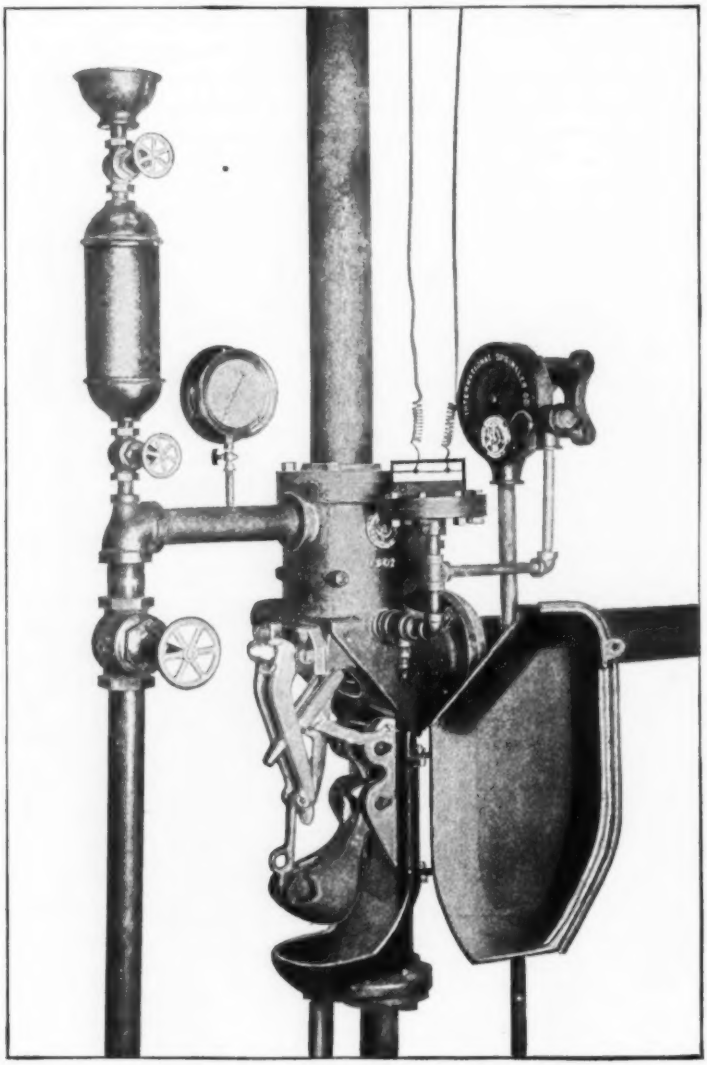


FIG. 2.

The following brief explanation explains the operation of the device:

The valve consists of a main body, divided into an upper ("air chamber"), closed by a vertical swinging check; an intermediate chamber (under atmospheric pressure when the valve is "set"), and a third ("water intake") chamber normally closed by a swinging check. This check also serves, however, a second function by closing the atmospheric opening through the intermediate chamber by its reverse side when the valve opens and water is admitted to the sprinkler system. The hinge of this water check is of peculiar form, having a long slotted protruding stem which engages an adjusting screw (23) and

swings on a fork centrally attached to this stem. The outside end of this stem, as already stated, is engaged by a set screw (23), which is adjusted through the upper end of hook (8), loosely swinging on knife-edged ears. The lower end of this hook is caught on a weight (6) swinging loosely on a pin. This weight, in turn, engages with a tumbler (9) loosely swinging on a knife-edge pin. The tumbler is held by the air clapper (13) by means of a vertical strut (10) passing loosely through the slot in the fork (7), the movement of this strut being limited by a loose pin connecting it with the fork.

The entire mechanism, therefore, practically consists of three loosely swinging levers connecting a standard air check with a standard water check. All the working mechanism lies entirely out of the water ways. The entire area of contact between the working parts does not exceed a square inch. All these contacts separate with an angular movement, hence no corrosive action could possibly prevent the valve from opening properly. The air and water valves are of equal area, and make metal to metal contacts.

The "Evans'" valve is claimed to be the simplest one on the market. There is no third valve required for tripping it, as the main air check is itself the tripping device. In other words, by the elimination of this third tripping valve (which is a feature of all other mechanical dry-pipe valves and which is the smallest and most clock-like part) the "Evans'" machine has developed a degree of simplicity and probability of operation under all conditions which has never been obtained heretofore.

The valve opens by the combined action of water pressure and the use of a weight; the weight, regardless of water pressure, causing opening when the air pressure is reduced to 9 pounds per square inch. This weight would, therefore, lift a column of water in the air system more than 20 feet in height, should it accidently be present. In "field practice" a water column of this height, or greater, rarely if ever occurs, hence the Evans' valve is incapable of being "water-columned." The influence of water pressure on this device is limited (by the leverages employed) to 6 pounds per square inch against the air clapper. Therefore, when the adjusting screw (23) is set tight enough to hold any available water pressure the valve still opens at not more than 16 pounds of air pressure.

The International Sprinkler Co., 517 Arch St., Philadelphia, Pa., have their sprinklers and alarm valves in use in every section of the country. Their merits have been thoroughly established by the severest of tests during a long series of years.

PATENT HOPPER BALE OPENER.

This machine was recently introduced by Howard & Bullough, Ltd., Accrington, England, and already is extensively used in England and on the Continent. It is giving very satisfactory results and is replacing the ordinary bale breaker. Its object is to thoroughly open cotton without damage to the staple preparatory to making mixings or being fed to the opener which follows. Its productive capacity is very great. A bale of cotton can be put through in six to ten minutes.

The machine is made with different kinds of feed and delivery arrangements. Generally a short feeding lattice is applied as shown on cut. Sometimes a much longer feeding lattice is used, from either side of which cotton can be taken from as many different bales as desired, ensuring thorough and even mixing. Waste can be evenly mixed with the cotton in any desired proportion. Owing to the thorough mixing the variously shaded colors of different cottons are no longer traceable in either cop or cloth.

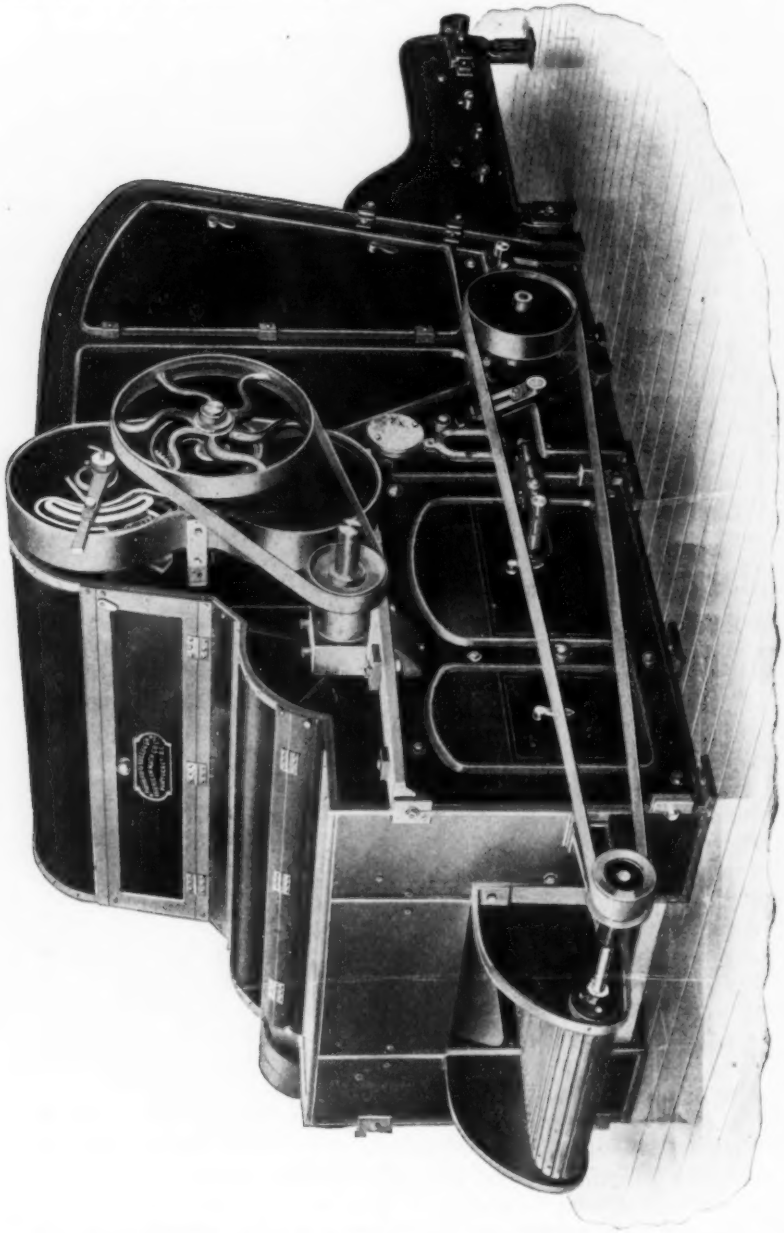
The delivery as shown on cut is intended to drop the cotton on the floor or into a mouthpiece of a conveying system. Other arrangements are made by which the cotton is carried upwards from the machine either by pipes or traveling lattices by means of which the cotton can be delivered at any desired point.

The machine is heavy and strongly built and is provided with an extra large hopper. The elevating lattice in hopper is made on a new improved patented system without any canvas backing. The slats are made of heavy selected stock, intersecting, and very strong. The spikes in apron are of suitable length

and strength, ensuring great durability. The patented intersecting form of slats entirely prevent the accumulation of cotton under the slats.

The amount of opening can be regulated by adjusting the patent stripping cylinder, the adjusting arrangement of which is conveniently placed on the outside of the machine.

The floor space of the machine with short feeding lattice as shown on the illustration is 13 ft. 3 in. by 6 ft. 10 in.



THE HOWARD & BULLOUGH HOPPER BALE OPENER.

The driving pulleys are on the right hand side of the machine when standing facing the

hopper or feed, and are 11 by 3 in. fast and loose, and should make 580 revolutions per minute.

Further information in regard to this machine may be obtained by applying to the builders, the Howard and Bullough American Machine Co., Pawtucket, R. I.

A GUARD FOR HYDRO-EXTRACTORS.

Accidents with hydro-extractors are, unfortunately, of frequent occurrence and usually of a very serious character, resulting, if not fatally, in most cases in maiming the victim for life. Even when the machine is so constructed and operated as to make explosion impossible, the operator is likely to, and

FIG. 1.

frequently does get caught by the rapidly revolving shaft, basket or goods, and either killed or seriously injured. It is to prevent this class of accidents that the attachment shown in the accompanying illustration is offered to the trade by the Johnston Novelty and Mill Specialty Co., Utica, N. Y.

The device is known as a guard or cover for hydro-extractors, which renders it impossible for the operator to get caught in the machine when in operation.

It consists of two sheet-steel plates fastened by a clamp and so arranged that it can be applied to any extractor. It is operated automatically by the lever which operates the machine. When the machine is set in operation by the lever shifting the belt the cover

FIG. 2.

locks, Fig. 1, thus making it impossible to operate the machines unguarded. Fig. 2 shows the position of guard when machine is stopped. This automatic device furnishes a complete protection from injury with one of the most dangerous machines used in connection with mills and laundries.

A large number of actions have been brought against owners of mills and laundries within the past year and some heavy verdicts have been recovered. The employers' liability acts have also added greatly to the risks taken by employers, and especially with this kind of machine. The company claim they are equipping a large number of plants with this device and it certainly should be investigated by every owner of a hydro-extractor.

The device can be attached to any style of extractor by any mechanic familiar with the machine. The Utica Knitting Company, Utica, N. Y., one of the largest mills of the kind, have all their extractors protected with this device and recommend it very highly.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Twill and Twist.

Editor Textile World Record:

Please explain the effect of changing the direction of twill and twist upon the appearance of twilled goods. I am a designer. A friend, a designer in another mill, and I cannot agree upon a statement of the effects produced with different combinations of twills and twists, yet neither of us has any difficulty in obtaining the desired effects in goods. Designer (346).

The reason Designer and his friend cannot agree is probably because they call the same direction of twist and twill by different names. Both are right, otherwise the work of one or the other would be defective. It is unfortunate that the practice of designating twist in yarn varies in different mills. This subject was ventilated in the Textile World some time ago and an attempt made to find out what was the more common practice.

Calling the twist at Fig. 1 left hand and its opposite right hand, the effects of the eight possible combinations of twill and twist are as follows:

	Warp Twill.	Warp Twist.	Filling Twist.	Effect.
1.	Right	Right	Left	Warp thrown up; Filling thrown up; Twill not distinct.
2.	Left	Right	Left	" " down; " " down; " " "
3.	Right	Left	Right	" " down; " " down; " " "
4.	Left	Left	Right	" " up; " " up; " " "
5.	Right	Right	Right	" " up; " " down; Warp twill distinct.
6.	Left	Right	Right	" " down; " " up; Filling " "
7.	Right	Left	Left	" " down; " " up; " " "
8.	Left	Left	Left	" " up; " " down; Warp " "

It should be borne in mind that a twill which is right when the warp threads are held in a perpendicular position becomes a left hand twill when it is turned one-quarter around to bring the filling threads perpendicular; in other words, the direction of a twill in relation to the warp, is of the opposite direction in relation to the filling.

To bring up either warp or filling the twill should run with the twist. Take No. 5 for example:

Here a twill running to the right when the warp is perpendicular throws a right twist warp up, the twill running with the twist. The same twill running to the left when the filling is perpendicular

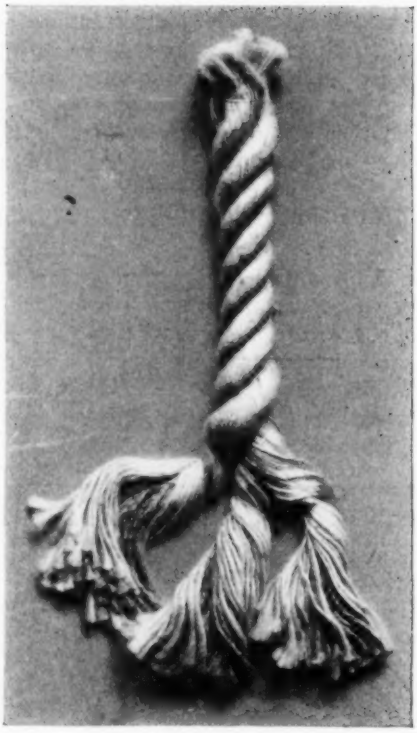


FIG. 1.

throws a right twist filling down, the twill running against the twist.

While this subject of twill and twist may appear confusing, an understanding of it is greatly facilitated by thinking of the direction of the twill as related to the yarn it is to affect, as in the illustration just given.

In the table (1 to 8) the direction of the twill is designated in the customary manner, that is, with the warp perpendicular.

We desire to caution every one against criticising the views of another regarding twill and twist unless he is certain as to what that other person calls right and what he calls left hand twist. Otherwise misunderstandings are sure to arise and the parties

to the controversy become twisted to both right and left.

The effect of twill and twist upon each other is greatly modified in practice by the character of the twill, the proportions of warp and filling in the cloth, the threads per inch, the size of the yarn and the number of turns of twist in the yarn.

Spinning Flax Fibre.

Editor Textile World Record:

We want to find a cotton mill to spin flax waste. We have a large and continuous supply which we want spun. Can you assist us in finding such a mill? Montana (344).

Any interested parties can obtain the address of our inquirer by application at this office.

Selvages of Carbonized Piece Goods.

Editor Textile World Record:

I am informed that the selvages of piece goods are often protected from the carbonizing process so that the fancy effects in the selvage are retained in the finished goods. How is this done? Does it require any special machine?

Stimmen (345).

In order to protect the selvages of carbonized goods from the effects of the process they are saturated with an alkali solution by means of a brush or sponge after the pieces have been soaked in the acid and extracted. The alkali solution should be of sufficient strength to neutralize the acid in the selvage. The work must be very carefully done in order to secure uniform results and in order to prevent the alkali from soaking into the edge of the piece.

Goods are treated in this manner to but a very slight extent in this country but we understand that in Europe the method is used to a greater extent.

Water Tanks.

Editor Textile World Record:

I was interested in the April Question and Answer concerning the water pressure on sprinklers and hydrants and would like to have you explain how to make the calculation for the following problem: We want to erect a square tank to hold 3,000 gallons of water to supply our mill sprinklers and hydrants. What must be the size of this tank and what will the 3,000 gallons of water weigh?

Marin (343).

A gallon of distilled water weighs 8.34 lbs., and a cubic foot of water weighs 62 1/2 lbs. It follows that the weight of the water and size of the tank in the case cited by Marin are calculated readily as follows:

3,000 (gallons) × 8.34 (lbs. per gallon) = 25,020 lbs. (12 1/2 tons).

25,020 (lbs.) ÷ 62 1/2 (lbs. per cu. ft.) = 400 cu. feet.

Cube root of 400 = 7.37 ft. (7 ft. 4 1/2 in.) size of tank.

The difference in weight between distilled and ordinary river water is so slight as to be negligible in such calculations as these. The labor of calculation consists mainly in the extraction of the cube root, the determination of the weight of water and cubic capacity tank requiring a simple multiplication and division only.

Cloth for Typewriter Ribbons.

Editor Textile World Record:

Where can I purchase cloth for typewriter ribbons? Typewriter (340).

We would consider it a favor if any of our readers would inform us where this material can be obtained.

Cotton Yarn in Skeins.

Editor Textile World Record:

Please inform me how cotton yarn in skeins is reeled and packed for the domestic trade.

Brunswick (347).

Cotton yarn is put up in skeins of various weights and sizes to suit special purposes. There are three standard sizes of reels, 54-inch, 72-inch and 90-inch. The 54-inch skeins usually weigh 2 1/2 to 3 ounces for twisted yarn and coarse single yarn. Finer numbers of single yarn run 1 3/4 to 2 ounces. Yarn for the lace curtain trade is put up in 6 ounce skeins. The 72-inch skeins weigh about 8 ounces although some trade use this yarn in 13 ounce skeins. The 90-inch skein is used principally by the rag carpet trade and the skeins weigh about 3 1/2 ounces.

There are two tie bands on each skein to hold it in shape and prevent tangling in handling. It is very necessary that the ends should be tied into the tie bands so as to be easily recovered by the winder. Cross reeled yarn is most satisfactory as to working qualities.

Spinners do not follow any uniform system in putting up skeins. Some put them in bundles weighing from 8 to 10 pounds and others in noddles of from 1 to 2 pounds. Bales range in weight from 300 to 500 pounds. The size and weight of the individual skein are the only points that are vital to customers and these vary according to the size of the yarn and the needs of the different branches of the trade, along the lines above mentioned.

Dyeing, Bleaching, Printing, Etc.

THE COMMERCIAL ANTIMONY SALTS.

This group of compounds is of considerable interest to the dyer mainly from the fact that the several members possess qualities that are of technical importance when compared with tartar emetic, the long established type with which all other similar products are compared. The principal advantages that are apparent over tartar emetic are their ready solubility and lower initial cost.

The most important members of the group are the following:

Antimony Lactate, known also as antimonine. It is claimed to be almost equal to tartar emetic in mordanting power. Although antimony lactate contains a very much smaller quantity of antimony trioxide—about 15 per cent.—the fact that it exhausts completely from the bath gives it its high position as a tartar emetic substitute which latter substance does not. It does not crystallize, absorbs water gradually from the air, and in consequence is perfectly soluble.

Double oxalate of antimony and potassium. This is a well crystallized salt containing when pure 23.6 per cent. of antimony trioxide but like the preceding product equal weights are equivalent to tartar emetic. It is quite permanent when exposed and is readily soluble in water. This salt is peculiarly interesting on account of its ease of dissociation in water which makes it specially available as a fixing salt for tanned cotton.

Common "antimony salt" is a double salt of antimony fluoride and ammonium sulphate forming well shaped crystals that are permanent in air and easily soluble in water, ten parts of water dissolving fourteen parts of the salt. Compared with tartar emetic it is about ten per cent. stronger.

Bifluoride of antimony is manufactured on a large scale by dissolving antimony trioxide in hydrofluoric acid and evaporating the solution to the point of crystallization when fine crystals are deposited. Unfortunately they absorb moisture from the atmosphere, hence the product must be protected from any dampness.

Antimony ammonium fluoride, also known as "patent salt," contains about 74 per cent. of antimony trioxide and forms heavy crystals. This salt is always used with chalk. The fixing bath is prepared in the following manner:

Antimony ammonium fluoride, 2½ lbs.
Water at 140° F. .....61½ gals.

This is poured into a mixture of

Chalk .....11 lbs.
Water at 140° F. ..... 61½ gals.

after stirring it is at once ready for use.

Of all the antimony compounds in use the most important is tartar emetic or, chemically, the double tartrate of antimony and potassium which, although it has a number of objections, still retains a very strong position as a fixing agent for tanned cotton. It was first brought to the attention of cotton dyers by Mr. Thomas Brooks of Manchester, Eng., about the year 1883.

It is manufactured on a large scale by boiling the trioxide in a solution of bitartrate of potassium from which the product is separated by crystallization. One strong point regarding this product is that it is almost always free from iron—something that cannot always be said regarding the more soluble products previously mentioned.

Regarding the use of these several salts all are cheaper than tartar emetic but there are certain conditions that should be observed to secure the best results from them, failure to note which only causes them to act imperfectly in the fixing bath; this is specially true regarding the temperatures to be employed. Unless the proper condition of their application is observed unequal deposits of antimony will occur causing unequal shades when the mordanted cotton is subsequently dyed.

Many dyers are in the habit of using excessive quantities of the antimony salts—not that the actual amount is large but they put

into the bath a quantity of the salt far in excess of the amount actually required to form the antimony tannate on the fibre with the tannin previously held by the cotton. Any antimony salt used in excess brings a waste.

Actual experiments made with a view of accurately determining the relative quantities of the various salts mentioned gave the following results which can be regarded as accurate for practical purposes. The figures are based upon 100 parts of tannin actually on the cotton.

Tartar Emetic	26.6 parts.
Antimony Potassic Oxalate	48.8 parts.
"Antimony Salt"	24.8 parts.
Double Antimony Fluoride	17.5 parts.
Antimony Ammonic Fluoride	14.9 parts.

A table showing the relative efficiency of these salts, assuming tartar emetic as the unit or standard, is:—

Tartar Emetic	1.
Antimony Potassic Oxalate	1.83
"Antimony Salt"	.93
Double Antimony Fluoride	.66
Antimony Ammonic Fluoride	.56

Regarding the fixation of tannin on the cotton fibres by means of antimony, any excess of the latter necessarily implies that the resulting dyed color will not be fast to washing, of course, assuming that an excess of dyestuff is not used. It is always a precaution to wash thoroughly after mordanting, but this is frequently disregarded with the above objectionable result. If only a sufficient quantity of antimony salt is used to "fix" the tannin and then wash to remove the products of decomposition, only clean mordanted cotton will result, so that if the mordanting is done with the view of bottoming for a given shade and the maximum amount of dyestuff used for that shade, only the best results can be expected.

If, on the other hand, an insufficiency of fixing salt be used uneven dyeings will result because the tannin on the cotton, not fixed with antimony, forms a loose lake with the dyestuff which is sure to show signs of crocking or bleeding.

The use of these various fixing salts for tannic cotton is very important and much of the trouble noticed in cotton checks and stripes can be traced directly to this stage of the manufacturing process.

SPOTS ON PIECE GOODS.

Spots and blemishes of various kinds are continually met with in all mills, but in a large number of instances it is quite impossible to accurately determine the true cause.

Machine oil is a frequent source of trouble, dropping either from the floor above or from overhead shafting, or by warps or pieces coming in contact with moving parts of machinery. If the oil is clean it may be removed by means of a sponge and benzine, but if it is from moving machinery the probability is that it will carry with it fine particles of dirt that cannot be removed.

Small pieces of card wire occasionally become tangled in the fibre and give rise to rust spots. Such spots may be removed, if light, by the cautious application of dilute muriatic acid followed by thorough washing.

Contamination of the dyeing materials is a remote cause for spots, but there is a case on record where certain yellow spots were quite distinct upon pieces dyed with logwood and it was only after a long time and many tests to ascertain the cause that it was discovered that the argols used for mordanting had been packed in barrels previously used for resin, and small particles of the latter substance found their way to the preparing bath. It is needless to remark that the resin acted as a resist for the mordant and the logwood dye as well.

Frequently spots are found upon machine dyed cottons, especially such as are dyed with the direct dyeing colors. As a rule these dyes are very sensitive to acids and metallic salts and in a number of cases these spots have been traced to this cause.

When spots on piece goods are found to recur at regular intervals throughout the length of the piece, it will be safe to assume that the trouble is in the machine and that some roller is at fault.

DYEING OF MADRAS YARNS.

The class of cotton fabrics so extensively employed for summer sheetings, etc., and known to the trade as "Madras" goods have been constantly gaining in popularity with the result that at the present time quite a few mills are devoting their entire energy to manufacture a constantly improved grade of these fabrics.

The most important point to observe in these goods is that the colors must be absolutely or as nearly absolutely fast as it is possible for the combined skill of the dye maker and the dyer to produce.

Up to the present time several classes of colors find extensive application in the production of the various shades called for by the designers of these fabrics. Blacks, formerly dyed with aniline oil or salts, are now almost exclusively obtained by the sulphur blacks, while the sulphur browns are fast driving the older cutch shades out of consideration, although Bismarck brown occupies a strong position.

A peculiar condition is to be observed in the case of indigo—this dyestuff is made less use of for the light and medium shades than formerly—the reason being the more desirable properties of the basic blues, dyes that meet every condition of fastness to washing and light.

As a matter of fact, the majority of the madras shades called for can only be secured by means of the basic dyes, and to this end it is necessary for the dyer to make sure that his mordanting materials are of superior quality. Except for the very heaviest shades it will be found desirable to use a stainless sumac extract or even a tannic acid in conjunction with an iron-free antimony salt, as by this means only can bright shades be guaranteed.

The process for mordanting for this special class of colors is a matter of more importance than the dyeing, for unless the mordanting is done thoroughly and with the proper quantities of tannin and antimony and proper time given, fast colors cannot be ensured.

The cotton should be thoroughly wetted and prepared by giving several turns in a hot liquor of pure sumac containing an equivalent of from 1 to 4 pounds of tannic acid per 100 pounds of cotton and allowed to soak while cooling for 6 or 8 hours or preferably over night. In the morning, lift, squeeze, and pass through a solution of antimony salt containing a quantity sufficient to fix the tannic acid on the cotton—it is the tannic acid that is the base of the mordant, not the antimony. After an immersion for 20 to 30 minutes remove from the bath and wash well. It is the thoroughness of this washing that determines whether the ultimate color is to be fast to washing and soaping or otherwise. Insufficient washing after mordanting always leaves a certain proportion of antimony salt soaked by the fibres, which at once combines with the color in the dye bath, producing loose particles of color lake, which bleed into adjacent whites and spoil the brilliancy of the otherwise bright shades.

The dyeing should always commence at low temperatures and proceed with successive additions to the dye bath so that the desired shade may be gradually built up instead of being obtained by one immersion. Such suddenly obtained shades, heavy and bright though they frequently are, are deficient in the one important attribute of this special class of dyeing—fastness. A shade that is gradually built up by several additions to the dye bath and during a gradual increase of temperature is almost always free from the defect of crocking for the reason that the true color has had, with the proper conditions, time to form in the fibres.

True shades are always obtained by slow dyeing, even for very light percentages, and when the same attention is given to the details of mordanting, the very best results can only be obtained.

Considerable use is made of the direct dyeing colors, but unfortunately they are not the very best adapted to madras goods, their lack of total resistance to soaping being their chief drawback. There are, however, a few that find considerable use in this work, among which may be mentioned the diazotized blacks and blues, direct browns that are after-treated with bichromate of potash and perior line of pinks, and a few other colors that are well known. Para red, however, fast sulphate of copper, the erikas yielding a su-

as it is to almost every influence is still unable to meet the test of soap fastness, it bleeding quite seriously into other colors without any apparent loss of its own depth of shade. Primulin red has stood the test of many years' use for madras dyeing and is perhaps the most satisfactory red cotton dye at the present time.

The most brilliant shades are always secured by dyeing upon bleached cotton mordanted with pure tannin; the bleaching being done by very weak solution of bleaching powder so that no tendency to weaken the fibres will occur.

The entire process of preparing the high class yarns for weaving into A 1 madras cloth is one of painstaking care and close attention, and in order to secure the best results it must in no instance be rushed.

PROTECTION OF EXPOSED IRON IN DYE HOUSES.

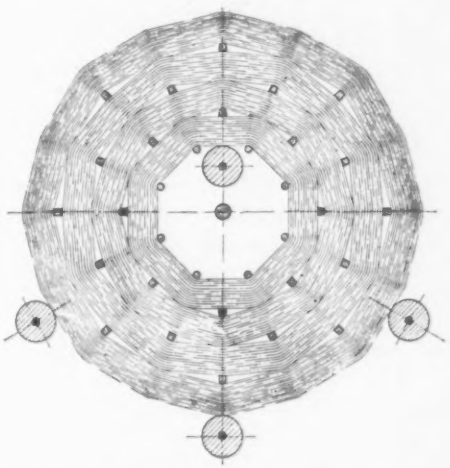
Pipes, columns, braces, and other iron fittings in dyehouses, bleacheries, etc., should be thoroughly protected from steam, acid vapors, and other corrosive agents, by the application of rust preventives, not only for the preservation of the metal, but as a precaution against scaling. Particles of rust frequently fall upon yarn or piece goods during handling and cause much trouble to eradicate, especially the stains that are developed.

The iron should be thoroughly cleansed of all rust by scraping, and when absolutely dry painted with hot boiled linseed oil; when this is dry paint with a coat of red lead in boiled oil, followed in a few days with another. This method is superior to any other.

A cheaper method and one that stands for a long time is to paint with several coats of asphalt varnish. It is needless to observe that, in either case, the iron to be protected must be clean of all rust, dry, and preferably hot.

ARRANGEMENT FOR WINDING AND BLEACHING CLOTH IN THE ROLL.

The form in which piece goods have heretofore been wound on the roll in bleaching has been objectionable owing to the resistance offered to the passage of the liquor through the goods, the solid roll acting as a filter and preventing a thorough bleaching of the goods. To overcome this difficulty a German firm has devised a method of winding the goods, shown in the illustration, which consists of placing wooden rods lengthwise of the



roll at regular intervals during the progress of the winding. The rods of one layer are placed half way between those of the previous layer. The advantages consist of the smaller layers of cloth through which the liquor has to pass and also in the air spaces between the layers which allow the liquor to pass uniformly through the whole mass of goods.

Rollers are placed on the inside as well as on the outside of the roll of cloth as shown in the illustration and press against the goods of their own weight. Owing to the polygonal shape of the cloth roll these rolls spring from one position to another. It is claimed that this mechanical pressure reinforces and assists the steam pressure which is used in bleaching. The roll of cloth is placed in a steam tight compartment which is partially filled with bleaching liquor; the roll is then revolved slowly under pressure.

New Color Cards.

Anthracene Chrome Brown D; Cassella Color Company, 182 Front St., New York City.

Ten shades of woolen yarn and raw stock dyed with Anthracene Chrome Brown D.

Azo Phloxine 2 G; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Two samples of worsted piece goods dyed with five and two per cent. respectively of Azo Phloxine 2 G, giving very attractive shades.

Pluto Black C F Extra; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

One sample of black cotton piece goods dyed with Pluto Black C F Extra.

The Dyeing of Cotton Piece Goods; Cassella Color Company, 182 Front St., New York City.

This is an elaborate color card showing 310 shades on cotton piece goods. Very complete directions are given for handling both mercerized and unmercerized goods in the dye bath. This card should be in the hands of every dyer of cotton goods.

Black Cotton Linings; Cassella Color Company, 182 Front St., New York City.

This card explains the method of dyeing black cotton linings containing white or silk effects. Four samples are shown for which full dyeing directions are given.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 81.

Yellow on Cotton Yarn.

Direct Golden Yellow on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Golden Yellow.
(Bosson & Lane, Atlantic, Mass.)
15 lbs. Common Salt.

Enter at 170° F., and dye at a boil one hour.

Direct Golden Yellow possesses good coloring power, and will be found to be an excellent yellow for direct cotton dyeing.

Recipe No. 82.

Blue on Worsted Yarn.

Acid Sky Blue on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Acid Sky Blue.
(F. E. Atteaux & Co., 176 Purchase St., Boston.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 120° F., bring slowly to a boil and dye at a boil for one hour.

Acid Sky Blue gives a bright shade of blue very similar to those of the alkali blues. It is fairly fast to light and washing.

Recipe No. 83.

Orange Brown on 100 lbs. Cotton Yarn.

Dianol Orange Brown Extra on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Dianol Orange Brown Extra.
(Thomas Leyland & Co., 53 India St., Boston.)
25 lbs. Common Salt.

Enter yarn at 170°F., bring to a boil and dye at a boiling temperature for one hour.

Dianol Orange Brown Extra gives a bright and bloomy shade and will be found very useful in dyeing compound shades. It dyes evenly, exhausts well and is fast to acids and alkalies.

Recipe No. 84.

Blue on Cotton Yarn.

Tetrazo Blue B X on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Blue B X.
(New York & Boston Dyewood Co., 156 William St., New York.)
25 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Tetrazo Blue B X possesses all the characteristic properties of the direct cotton colors, dyes evenly and possesses good coloring power.

Recipe No. 85.

Red on Cotton Yarn.

Tetrazo Red 10 B on 100 lbs. of cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Red 10 B.
(New York & Boston Dyewood Co., 156 William St., New York.)
2 lbs. Soda Crystals.
20 lbs. Common Salt.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Tetrazo Red 10 B possesses all the characteristic properties of the direct cotton colors, and will be found an excellent direct red.

Recipe No. 86.

Brown on Cotton Yarn.

Thiogene Brown G G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thiogene Brown G G.
(H. A. Metz & Co., 122 Hudson St., New York.)
3 lbs. Soda Ash.
80 lbs. Common Salt.

Enter at about 160° F., and dye at a temperature between 160° and 195° F. Rinse well and fix in a new bath made up with

2½ lbs. Copper Sulphate.
2½ lbs. Potassium Dichromate.
2 lbs. Acetic Acid,

for one-half hour at a temperature of 140° to 176° F. Thiogene Brown G G possesses excellent fastness to washing, milling and boiling in soap. Its fastness to light is also very good.

Recipe No. 87.

Black on Worsted Yarn.

Benzyl Black B on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Benzyl Black B.
(A. Klipstein & Co., 122 Pearl St., New York.)
10 lbs. Glauber's Salt.
3 to 5 lbs. Acetic Acid.

and if necessary to exhaust:

½ to 1 lb. of Sulphuric Acid

toward the end of the dyeing.

It should be noted, however, that too much sulphuric acid will redden and dull the shade.

Benzyl Black B is easily soluble, dyes level and gives a full, bloomy shade, which possesses very good fastness to most of the color destroying agencies.

Recipe No. 88.

Green on Worsted Yarn.

Cyanole Fast Green G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Cyanole Fast Green G.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Cyanole Fast Green G dyes very level, gives a very bright shade, is exceedingly fast to alkalies and washing, and is also fast to stoving and light. It does not tint cotton in a mixed fabric.

It is worthy of consideration for yarn and piece dyeing, and for the production of compound shades.

Recipe No. 89.

Blue on Cotton Yarn.

Direct Blue 2 B R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Direct Blue 2 B R.
(L. P. Fortner, 36, 38 Strawberry St., Philadelphia.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at a boil for one hour.

Direct Blue 2 B R gives a reddish shade of blue, dyes evenly, has a high coloring power, and is excellent for dyeing cotton and woolen union goods, as it goes on cotton better than wool, thus covering all the cotton specks in the goods.

Recipe No. 90.

Brown on Worsted Yarn.

Compound Shade on 100 lbs. worsted yarn. Prepare the dye bath with

3½ lbs. Meta Chrome Mordant.
1¼ lbs. Meta Chrome Yellow R.
1½ lbs. Meta Chrome Brown B.
¼ lb. Meta Chrome Bordeaux B.
(Berlin Aniline Works, 213, 215 Water St., N. Y.)

Enter at 140° F., raise to the boil and dye at a boil for two hours.

The shade thus produced is very fast to light and fulling.

Recipe No. 91.

Pink on Cotton Yarn.

Dianol Brilliant Red X on 100 lbs. cotton yarn. Prepare the dye bath with

6 oz. Dianol Brilliant Red X.
(Thomas Leyland & Co., 53 India St., Boston.)
1 lb. Soap.
2 lbs. Soda Ash.

Enter at 140° F., raise to a boil and dye for one-half to three-quarters of an hour.

Dianol Brilliant Red X when dyed in this manner gives a bright and economical shade of pink which possesses good fastness to light and alkalies. With heavier shades a rich brilliant red is obtained.

Recipe No. 92.

Violet on Worsted Yarn.

Azo Wool Violet 7 R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Azo Wool Violet 7 R.
(Cassella Color Co., 182 Front St., N. Y.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Azo Wool Violet 7 R is extremely fast to light

and dyes very level. Its fastness to alkalies is good. When applied to union goods it does not stain cotton, artificial silk or china grass. It is very useful in the production of compound shades.

Recipe No. 93.

Red on Worsted Yarn.

Azo Phloxine 2 G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Azo Phloxine 2 G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., N. Y.)
20 lbs. Glauber's Salt.
2 to 4 lbs. Sulphuric Acid.

Enter at 100° F., bring to a boil and dye at a boil for one hour.

Azo Phloxine 2 G dyes very level, is fast to light and alkalies. Its fastness to rubbing and stoving is also very good. It does not tinge cotton, and is, therefore, valuable in dyeing two colors on cotton and wool mixed goods.

Recipe No. 94.

Green on Worsted Yarn.

Fast Azo Green B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Azo Green B.
(H. S. Vila, 115 So. Second St., Philadelphia.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 180° F., bring to a boil and dye at a boil for about three-quarters of an hour; lift, rinse and dry.

Fast Azo Green B is fast to stoving, sulphuring, milling, and comparatively fast to sunlight.

Recipe No. 95.

Brown on Worsted Yarn.

Domingo Seal Brown N on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Domingo Seal Brown N.
(C. Bischoff & Co., 88 Park Place, N. Y.)
15 lbs. Glauber's Salt.
3 to 5 lbs. Acetic Acid.

Enter yarn at 180° F., bring to a boil and dye at this temperature for about one hour. When bath is exhausted, add

2 lbs. Potassium Dichromate

and boil one-half hour longer.

Domingo Seal Brown N produces a rich shade of brown possessing excellent fastness to fulling, sunlight, acid, etc.

Recipe No. 96.

Blue on Worsted Yarn.

Alizarine Blue C R W on 100 lbs. chrome mordanted yarn.

First mordant the yarn in a dye bath made up with

3 lbs. Potassium Dichromate.
2½ lbs. Lactic Acid.

Enter at 140° F., bring to a boil and mordant at a boil for one and one-half hours.

Then dye in a bath made up with

3 lbs. Alizarine Blue C R W.
(Sykes & Street, 85 Water St., N. Y.)
½ lb. Acetic Acid.

Enter at 100° F., bring to a boil and dye at a boiling temperature for one hour or more, and when the bath is practically exhausted add

2 lbs. Acetic Acid.

Alizarine Blue C R W is extremely fast to light and milling.

Mercerizing Machine. Moritz Jahr, Gera (Reuss), Germany, has recently placed on the market an improved mercerizing machine for piece goods, for which the following advantages are claimed: Higher lustre, economy in consumption of alkali, regular and full width of cloth, large production, continuous process, convenience in operation, small floor space and wide scope of adjustment.

Dyeing and Extracting Machine. B. Cohnen, textile machine builder, Grevenbroich, Rheinland, Germany, has introduced a novel dyeing machine by which the material is prepared, dyed, rinsed and extracted in the same apparatus without removal from the machine. A description appears in another part of this issue.

Finishing Machine. Friedrich Haas, a Prussian manufacturer, has placed on the market a finishing machine which combines the operation of cleaning the fabric, shearing it on both sides and giving it a slight calender. The builder has secured a Manchester agent to introduce the machine into England.

Paris has one acre of park for every fifteen persons; Liverpool, one for every one thousand.

Mill News.

COTTON.

New Mills.

*Alabama, Huntsville. The Madison Mfg. Co. will equip their new building, not quite completed, with 15,000 spindles and 500 looms for making print cloths. The machinery is being shipped.

*Alabama, Siluria. The main building of the Siluria Cotton Mill Co., which contemplates starting production of goods by next September, will be 260 by 80 feet. A separate building, two stories, will be built for the opener and picker rooms and one, 75 by 75 feet, one story, for warehouse. As previously reported they will make 28 inch 64 by 64 print goods.

*Connecticut, Putnam. John K. Russell, of Manchester, N. H., president of the Messenger Mills Corporation, and F. M. Messenger, will start for California, May 11th, and with David E. Morgan, vice-president of the company in California, will examine advantages of different localities for site for the new plant.

*Georgia, Lafayette. At meeting held recently by stockholders and directors of the Lafayette Cotton Mills, J. E. Patton was elected president; F. D. Fortune, vice-president, and W. A. Nichols, secretary and treasurer, and E. Montgomery, general manager. Steps will be taken at once on securing site for the mill.

*Massachusetts, New Bedford. It is expected that the new Butler Mill will be in full operation by next September. Fifty looms are now in operation on orders. New sections will be started as soon as the yarn is ready.

*Mississippi, Magnolia. The Magnolia Mills propose starting operations in a few weeks, making canvas and other cheap grades of cotton goods. The plant will have complete equipment of 5,000 spindles and 150 looms.

North Carolina, Charlotte. The Hoskins Cotton Mfg. Co. has been incorporated with capital stock of $500,000, of which $37,500 has been paid in. E. A. Smith, J. P. Wilson and Jeremiah Goff are interested in the concern.

*North Carolina, Enfield. The Enfield Cotton Mill Company has been incorporated with capital stock of $50,000, to operate the plant previously reported to be started here by W. N. Brown. James T. Green and Charles E. Gottslick are also interested in the company.

*North Carolina, Jonesboro. The Clark Manufacturing Co., recently incorporated with capital stock of $100,000, has started work on erection of a new building. They expect to have the plant ready to start operations about October, making denims and plaids, with equipment of 100 looms. A dye house will be attached to the mill, which will be operated by steam. David Clark (Charlotte) is president of the company and W. A. Graham Clark (Jonesboro) treasurer.

WOOLEN.

New Mills.

*Canada, Toronto. The Toronto Carpet Manufacturing Company has let (to Philadelphia contractor) contract for the erection of a new mill, 248 by 64 feet, five stories and basement.

*Kentucky, Mayfield. The Old Woolen Mills, which bought the mill at this place from the Mayfield Woolen Mills Clothing Co., make half wool cassimeres, operating 20 broad and 32 narrow looms and 4 sets cards. H. S. Hale is president of the concern and G. O. Duncan, superintendent.

*Maine, Corinna. The woolen mill, destroyed by fire last March, is to be rebuilt. A building, 130 by 50 feet, three stories (including basement) will be erected.

*New Hampshire, Somersworth. Work is nearing completion on installation of machinery in the branch mill of the Queensbury Mills, of Worcester. They expect to begin work in about another week.

*Nova Scotia, Amherst. The Hewson Woolen Mills, H. L. Hewson, president and manager, are now in active operation. They manufacture "Hewson" tweeds and other specialties.

Pennsylvania, Harrisburg. The Harrisburg Woolen Company has been recently organized and purchased the Harrisburg Match Factory and will remodel and equip same for manufacturing woolen goods. Two sets of machinery will be installed. A. Carson Stamm is attorney for the company.

*Pennsylvania, Philadelphia. Thomas Henry, Jr., recently reported having started a carding and spinning plant at this place, will install 1,500 new spindles for making carpet and upholstery yarns. The plant is equipped with 12 sets of woolen cards. Sell yarns direct.

Pennsylvania, Philadelphia. A one story building for spinning purposes is under construction at Ashland Street and Frankford Creek, for William Bault.

*Tennessee, Springfield. The Springfield Woolen Mills Company has been organized with capital stock of $50,000. This refers to plant which Harry Tatum and Bro. were reported as projecting. Others interested are James Brown, A. B. Porter and E. B. Long.

West Virginia, Keyser. Jacob E. Patcheon is to build a woolen mill at this place. The main building will be 180 by 195 feet.

Enlargements and Improvements.

*Nova Scotia, Oxford. Plans have been prepared and bids are now out for the erection of a new mill, 202 by 58 feet, two stories, for the Oxford Woolen Mills. A large part of the old mill will be torn down, what remains, to be used for storing wool. Company proposes having the new plant ready for occupancy by fall.

Ohio, Jackson. The Jackson Woolen Mills Co. propose installing machinery for manufacturing their own shoddy.

Oregon, Bandon. The Bandon Woolen Mills Co. contemplate enlarging the mill.

Ontario, Elmira. An addition, 100 by 50 feet, two stories, is under construction for the Elmira Felt Co.

Pennsylvania, Chambersburg. An addition, 40 by 50 feet, two stories, brick, is to be built for the Chambersburg Woolen Company. The first floor will be used for wareroom and the second, manufacturing purposes.

*Pennsylvania, Clifton Heights. Work has begun putting on roof on new addition for the Runnymede Worsted Mills and work will soon start on installation of the machinery.

Pennsylvania, Philadelphia. Thos. Wolstenholme, Sons & Co., operating the Allegheny Worsted Mills, are installing new twisters in the plant.

Rhode Island, Providence. The Colwell Worsted Mills have been incorporated with capital stock of $100,000 by R. Colwell, U. and Edith M. Colwell. This is probably an incorporation of R. Colwell & Co., making worsted dress goods in the city.

Tennessee, McMinnville. The Tennessee Woolen Mill Co. contemplates installing additional preparatory machinery.

Utah, Provo City. The Provo Woolen Mills Co. contemplate installing some looms in the plant.

Vermont, Winooski. A new set of carding machinery is being installed in the Colchester Mills.

Virginia, Buena Vista. Extensive improvements are being made by the Buena Vista Woolen Co. They have recently completed erection of an addition, 100 by 80 feet, for dressing room, installed a new dresser, spooler, set cards and other machinery.

Mills Starting Up.

*Massachusetts, Leicester. Operations have been started in the satinet mill established here by R. Ashworth.

*New Hampshire, Somersworth. Operations have begun in the spinning room of Queensbury Mills.

*New York, Utica. Operations have begun in the new mattress felt mill recently established here by Foster, Allison & Co.

*Ohio, Cincinnati. Benj. Hey & Co., whose plant was recently destroyed by fire, expect to resume operations in about thirty days.

KNIT.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

New Jersey, Paterson. A new plant will be started in the Todd Mill, on Van Houten Street, by Miegel & Blum, of New York. Operations will be started with 20 looms for making silk ribbons.

New Jersey, Paterson. The Schmitt & Meurer Silk Company has been incorporated with capital stock of $25,000. They will manufacture silk dress goods and will be located in the Murray Mill. Frank A. Schmitt and Otto Meurer are among the incorporators.

New York, Binghamton. A new silk mill will be erected for the Chenango Silk Co., recently organized with capital stock of $150,000.

*New York, New York. The Tremont Mills Co., recently reported incorporated, will manufacture silk ribbons. The plant will not be ready before July 1st.

Pennsylvania, Philadelphia. The Knecht-Mellon Company, Ltd., is a new concern recently started, manufacturing narrow silk and cotton fabrics, operating 16 looms.

Enlargements and Improvements.

Connecticut, Montville. Several additional machines will be installed in the basement of the Chaffee Silk Mill.

Connecticut, Rockville. An addition, 50 by 30 feet, 2 1/2 stories, will be built to E. Martin's Sons' mill. They manufacture fish lines, etc.

Connecticut, Willimantic. Ten new spoolers will be installed in the west mill of the Holland Manufacturing Company's plant.

Massachusetts, Northampton. A new steam plant is being installed in the Belding Bros. Silk Co.'s mill.

New Jersey, Carlstadt. An addition is to be built to Scharg Bros.' silk mill.

*New Jersey, Little Falls. Operations have begun by Fogle & Killin, in the plant formerly occupied by Charavay, Bodvin & Co. The complete equipment, comprising 222 looms, has not yet all been placed. A dye house is operated in connection with the plant. They make dress silks.

New York, Hornellsville. The Steuben Silk Mills have been incorporated with a capital stock of $75,000.

New York, Sidney. The Clark Textile Company has purchased the Monarch Knitting Company's mill and will remove same to adjoin their present plant. They contemplate also building a new power house and will employ a number of additional people after improvements have been completed.

*Pennsylvania, Philadelphia. The Sauquoit Silk Company is about ready to remove to their new mill, 4012 Calrissa Street, Nicetown. They will operate 350 looms in new plant, on broad silks.

Mills Shutting Down.

New Jersey, Paterson. The Banner Silk Mill has been shut down for a month. It is thought

that other silk mills will do likewise, on account of present dullness of silk industry.

MISCELLANEOUS.

New Mills.

Ontario, Essex. The Essex Flax Mills, in which A. H. Raymond is interested, have begun work on the erection of a new building, 45 by 65 feet, two stories, with engine house, 40 by 30 feet. A similar plant will also be built at Belle River, Ont. They expect to be ready to start operations by July 1st, making flax, hemp and tow, and will sell product direct.

Pennsylvania, Philadelphia. William A. Ingram, 714 N. 43d St., operating a finishing plant, has formed a partnership with other parties and will soon start a plant preparing flax for spinning purposes. All arrangements have been completed and Mr. Ingram is now looking for a party to manufacture the necessary machines after his own plans and specifications.

*Pennsylvania, Schuylkill Haven. Contract has been let for the Columbian Bleaching & Dye Works' new plant. The building will be 100 by 80 feet, one story, and is expected to be ready for operations early in June.

Rhode Island, Shannock. Additional machinery has been installed in the Shannock Narrow Fabric Co.'s mill, increasing the capacity.

South Carolina, Anderson. The Orr Cotton Mills are to enlarge the plant and increase their capacity. Work will start at once on building.

Enlargements and Improvements.

Massachusetts, Indian Orchard. The Hodges Fibre Co. is to instal additional looms in the mill.

*Pennsylvania, Hanover. Hanover Cordage Company, which was recently incorporated with a capital stock of $100,000, and absorbed the Bonte Cordage Co., Ltd., will erect a new building, starting work on construction about June the 1st. They expect to have it completed by November. This concern manufactures commercial twine, fine and coarse jute wrappings, etc.

Pennsylvania, Lansdale. The Lanza Silk Co. is considering the erection of two additions, one 22 by 65 feet, for boiler, engine and finishing room and an ell for business office and fireproof vault for storage of finished goods.

Pennsylvania, Philadelphia. The Keystone Fast Black Dye Works, John Boston, proprietor, 1838 W. Huntingdon St., are to be removed to larger quarters at Jasper and Westmoreland Sts.

Pennsylvania, Philadelphia. An application for a charter will be made by the E. G. Chester Dyeing Co., now operating a finishing and dyeing plant in this city.

*Pennsylvania, Reading. The contract for rebuilding the Liberty Dye Works, partially destroyed by fire, has been let. The building will be greatly enlarged. They will install considerable new machinery, employing additional people.

FIRES.

Minnesota, La Crescent. The Toledo Woolen Mill., M. Webster & Sons, proprietors, has been totally destroyed by fire. The loss is estimated at about $15,000. Plant will be rebuilt at once.

New Jersey, New Brunswick. Alfred March & Co's knitting mill has been destroyed by fire. This company makes underwear. The loss is fully covered by insurance.

New Hampshire, Laconia. The H. H. Wood Co.'s knitting mill has been destroyed by fire. Company made woolen hosiery, operating 10 sets cards and 230 knitting machines. The loss is placed at $85,000. Plant was insured for $40,000.

New Jersey, Paterson. Charles R. Reiher's silk throwing and braid mill has been partially destroyed by fire. The loss is covered by insurance.

Pennsylvania, Philadelphia. O. J. Meinhardt's Sons' dyeing and finishing works, Emerald St., above Westmoreland, have been destroyed by fire. The loss is estimated at about $25,000.

FACTS AND GOSSIP.

A Lyons manufacturer of silk muslins is reported as interested in starting a factory in the United States, and will do so if some town will furnish $40,000 necessary to start the plant. This comes through Consul J. C. Covert, of Lyons, France.

Arkansas, Camden. At meeting held recently by the Camden Commercial League, about one-half the stock ($50,000) necessary for establishing cotton mill at this place, has been subscribed by the citizens. J. W. Brown and Col. Richard Hibbard are interested.

*California, Napa. It is thought that Mr. E. H. Tryon, who recently purchased the Napa Woolen Mill, intends selling the mill to other parties, as he does not wish to run the plant himself. The old company is still operating same, running out stock and closing up the business. The machinery is all in good condition. Mill is equipped for making blankets, flannels and robes.

*Canada, Hamilton. Alex. Main & Son, whose plant was destroyed by fire some time ago, have not rebuilt same. They are not using any machinery, but are doing a little manufacturing without power and dealing in twines and ropes of all kinds.

*Colorado, Trinidad. The new mill proposed here is for a two set plant, which can be increased in capacity. The matter is said to be taking definite shape.

Connecticut, Baltic. At a meeting held recently by the stockholders of the Baltic Mills Co., John Eccles was elected president; Frank Sayles, treasurer and Harold Lawton, general manager.

Connecticut, East Killingly. It is reported that A. C. Bishop's mill is to be shut down on account of high price of cotton.

Connecticut, Killingly. The capital stock of the

Williamsville Mfg. Co. has been decreased to $100,000. Was formerly placed at $200,000.

*Georgia, Cordele. John Blood & Co., Philadelphia, advise us that they are not interested in erection of a mill here, as previously reported.

*Georgia, Tennille. It is reported that the machinery in the Tennille Cotton Mill may be removed to Raleigh, N. C. Broadus Willingham is trustee for the bondholders of the plant.

Georgia, Whitehall. A project is reported under foot for building a large cotton mill here, to be operated with power to be generated at Barnett's Shoals. Capt. James White, of Barnett Shoals, is reported as interested.

Illinois, Chicago. The Charlton Silk Company has been incorporated with capital stock of $28,000 by Harry Goodman, A. B. Schafner and H. F. Becker.

Iowa, Columbus. The Tex Doe Na Manufacturing Company has been incorporated with capital stock of $50,000, for manufacture of all kinds of textile fabrics and other materials for interior decoration. C. C. Aler, Thomas Hanna, Louis M. White and Milo E. Dunn are interested in the project.

Louisiana, New Iberia. The New Iberia Cotton Milling Company's plant has been sold for $5,500. This plant was operated on fleece lined underwear and equipped with 14 knitting machines. A company will probably be organized to operate the mill and other machinery installed.

Maine, Kennebunk. The town is now considering a proposition for rebuilding the electric light plant, recently destroyed by fire, and also to construct a building suitable for Goodall Bros., who were to start an experimental plant in a building also burned, for making Japanese mattings.

Maine, South Berwick. The Merrill Thread Company has been incorporated with a capital stock of $50,000, for manufacturing cotton and linen threads. H. F. Butler (Boston) is president and treasurer of the concern.

Maine, West Buxton. It is reported that the Berryman Mill has been leased by Newton Darling, of Cherry Valley, Mass. This mill is equipped with 2 sets cards and 10 looms and has been idle for some time.

Manitoba, Winnipeg. The Gibson-McLaughlin Carpet Co. has been organized with capital stock of $100,000. W. M. Gibson, W. J. McLaughlin and E. L. Taylor are interested in the enterprise.

Massachusetts, Athol. The satinet and blanket mill operated by W. H. Kauffman, is being operated on extra time to keep up with orders.

*Massachusetts, Fall River. At a meeting of the stockholders held recently it was voted to change the name to the "Ancona Company." The preferred stock has all been subscribed and most of the bonds ($200,000) placed.

Massachusetts, Indian Orchard. The Indian Orchard Co. is to remodel and enlarge the No. 1 mill, making it uniform in size and appearance with mill No. 2. A building, 90 by 210 feet, 5 stories high, will be built. Additional machinery will be installed.

*Massachusetts, Otter River. The Templeton Mills have been sold to the Otter River Leather Co.

Massachusetts, Plymouth. Owing to the insecure condition of the dye house at the Puritan Mill of the American Woolen Co., the dyeing has been transferred to the plant at Providence. It is not yet known just what will be done regarding dye house repairs at this place.

Massachusetts, Spencer. It is reported that parties are negotiating for the Green Factory for purpose of starting up a plant to manufacture satinets. The Board of Trade has also been asked to furnish a suitable water supply.

Missouri, Hardin. The Hardin Weaving Mill, L. F. & A. E. Ferguson, proprietors, has been put in operation. Number of improvements have recently been made to the plant.

New York, Amsterdam. The Shuttleworth Dyeing Company has been incorporated with capital stock of $16,000, by William Shuttleworth, John R. Blood and John Shuttleworth. They will operate the Shuttleworth dye plant.

New York, New York. The United Ribbon Printing Company has been incorporated with capital stock of $5,000. N. D. Stearn, and C. W. Kappers are among the directors.

North Carolina, Kenly. A cotton mill project is being agitated here.

North Carolina, Laurelbluff. The Steele Bros. Company has been incorporated with capital stock of $100,000 for manufacturing cotton goods. M. K., N. F. and L. C. Steele are interested.

North Carolina, Louisburg. It is reported that a company is being formed for erecting a cotton mill here and that a large amount of stock has taken by local capitalists.

Messrs. Wm. Ryle & Co., Newton Upper Falls, Mass., have adopted the American Moistening Company's system of humidification in their silk mill.

The Hamlet Textile Company, Woonsocket, R. I., have placed their order for humidifiers with the American Moistening Company, Boston, Mass.

The Barnard Mfg. Company, Fall River, Mass., have adopted the American Moistening Company's system of humidification.

The American Moistening Company, Boston, Mass., have a large repeat order for humidifiers from the Tucapau Mills, Tucapau, S. C.

Valentine Bliss, Scranton, Pa., has placed an order for humidifiers with the American Moistening Company, Boston, Mass.

The York Silk Mills, York, Pa., have adopted the American Moistening Company's system of humidification.

North Carolina, Statesville. The Bloomfield Manufacturing Company has been incorporated recently with capital stock of $150,000 for manufacturing textile fabrics. H. A. Yount (New Sterling), A. B. Sanders (Statesville) and Chas. Webb & Co. (Philadelphia) are interested.

North Carolina, Washington. It is reported that a knitting mill and cotton mill are projected here.

Pennsylvania, Aston Mills. The Victoria Plush Co. at Swarthmore, contemplates enlarging their plant and is reported as negotiating for the West Branch Mill of Rhodes Bros., recently reported failed.

Pennsylvania, Chester. H. B. Mitchell & Co., of Philadelphia, are reported as having leased the No. 3 mill of the Esrey Manufacturing Co.'s plant. They will start operations soon making woolen yarns.

Pennsylvania, Hanover. The Bonte Cordage Co. has made application for incorporation under new name of the Hanover Cordage Company, with capital stock of $100,000. H. N. Gitt is president of the company, John Greenway, vice-president and superintendent and F. W. Weber, treasurer.

Pennslyvania, Littlestown. Plans are being prepared for the erection of a $50,000 silk mill at this place.

Pennsylvania, Philadelphia. The Brighton Worsted Co., is to be incorporated to operate the Brighton Mills, C. F. Sloane, proprietor. Others interested in the company are Clarence Kenyon, B. S. Ferguson and Robert C. Strafford.

Pennsylvania, Philadelphia. A. Kirchies is operating a plant at 1909 Adams Street, mercerizing cotton yarns.

Pennsylvania, Philadelphia. Bray & Moulson, dyers and printers of hosiery, contemplate removing their mills at 1210 Orianna St. and Hancock Street (above Oxford), to one large building.

Pennsylvania, Philadelphia. The Angora Woolen Mills property, comprising mill buildings, land, machinery, fixtures, houses, etc., has been sold to Rev. Bernard McMackin, president of the company for four years. It is not known what will be done with the plant, which is now shut down.

Rhode Island, Chepachet. It is reported that William Prendergast is to start operations in a woolen mill that has been idle for some time.

Rhode Island, Lafayette. It is reported that a new company to be known as the Wakefield Manufacturing Co., has purchased the Wakefield Mill of the Rodman Manufacturing Company's plant and that same will be put in operation making a high grade of woolens. Orrin P. Kenyon and Louis F. Bell are interested in the new concern.

Rhode Island, North Smithfield. The Blackstone Manufacturing Co., Blackstone, Mass., is considering plans for a large mill to be erected here, provided they are exempted from taxation for 10 years. A building 500 by 125 feet, four stories, will be built and equipped with 45,000 spindles and 11,000 looms.

*Rhode Island, Providence. Edwin A. Smith is president of the Colwell Worsted Mills, recently reported incorporated with capital stock of $100,000 to operate R. Colwell & Co.'s mill. Ralph Colwell is treasurer and John Broadbent, superintendent. The mill is equipped with 40 looms.

Rhode Island, Woonsocket. The National Pile Fabric Co.'s plant is to be removed from this place. The local office has been closed and business is now transacted through the New York office.

*South Carolina, Goldville. George Johnston is president of the Banna Mills, recently reported incorporated with capital stock of $100,000 to operate the Goldville Cotton Mills. L. W. Blalock is vice-president and treasurer of the company.

South Carolina, Salley. W. S. Peterson and Tully Sawyer are reported as interested in securing a cotton mill at this place and are soliciting subscriptions, of which $50,000 have been secured.

South Carolina, Wagener. The Wagener Manufacturing Company has been incorporated with capital stock of $100,000 for purpose of erecting a cotton mill. J. W. Lybrand, D. K. Gautt, J. W. Baughman, L. B. Etheredge and others are interested in the project.

Texas, Belton. A new company has been organized with capital stock of $50,000, to take over the plant of the Belton Cotton Mills, and enlarge, improve and operate same. O. A. Robbins (Charlotte, N. C.) and Peter Hammersmith and Geo. W. Tyler (Belton) are the incorporators.

*Texas, Marble Falls. The Water Power Company is now reported as interested in establishing a cotton mill here and will utilize some unfinished buildings for the purpose. Modern machinery is to be installed.

*Virginia, Fries. Operations have been started by the Washington Cotton Mills, whose plant is equipped with 45,000 spindles and 1400 looms. They manufacture cotton goods and later will make duck. E. H. Fries is president of the concern and W. C. Ruffin, secretary and treasurer.

West Virginia, Guyandotte. The Guyandotte Woolen Mills Co. has been incorporated with capital stock of $25,000 by W. H. Stewart and others. They will operate the plant of which Mr. Stewart has been proprietor.

The High Shoals (Ga.) Cotton Mills have placed their order for humidifiers with the American Moistening Company, Boston, Mass.

The Hope Mills Manufacturing Company (N. C.) have placed their order for humidifiers with the American Moistening Company, Boston, Mass.

The Magnolia (Miss.) Cotton Mills have adopted the American Moistening Company's system of humidification.

The Clark Thread Co., Newark, N. J., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

The Tifton (Ga.) Cotton Mills have ordered a system of humidifiers of the American Moistening Company, Boston, Mass.

Personals.

Cotton.

S. W. Olliver, of the McColl, S. C., Cotton Mills, has been promoted to be superintendent of that plant.

C. Enos Bean, Taunton, Mass., has gone to Lawrenceville, Ga., where he is the agent of the Lawrenceville Mfg. Co.

Ernest E. Kirby has resigned as overseer of carding for the Stafford Mills of Fall River, Mass., to accept a similar position with the Slade Mills, in that city. P. H. McKenna succeeds him.

J. E. Stott, formerly night superintendent at the Millville Mfg. Co., Millville, N. J., is at the Eclipse Mill, North Adams, Mass.

William Shaul, formerly overseer of the lower gingham mill of the Renfrew Mfg. Co., Adams, Mass., is now with the Libbey & Dingley Mfg. Co., Lewiston, Me., occupying a similar position.

E. W. Thomas, formerly of the Tremont & Suffolk Mills of Lowell, and later of North Carolina, has accepted the position of general manager of the Olympia Mills, Columbia, S. C., and entered upon his new duties last week.

George Mallinson, who has been overseer of dyeing for the Carolina Mills Co., Carolina, R. I., the past eight years, has resigned and moved his family to Pascoag, R. I. He has gone to England for a two months' visit, leaving this country May 21st. His place has been filled by Fred Burkley of Yantic, Conn.

Robert L. Tate, of the Olympia Cotton Mills Co., Columbia, S. C., has been elected secretary and treasurer of the Mecklenburg Cotton Mills Company of Charlotte, N. C., and Mr. Tate assumed the duties of his new position on May 1st.

Charles Fry, engineer, late at the Revolution Mills, Greensboro, N. C., has gone to the Canton, Ga., Mills.

B. J. Dobbins has resigned as overseer of spinning at the Pelzer Cotton Mills, Pelzer, S. C., and entered upon his new duties as superintendent of the cotton mill at Ninetysix, S. C.

H. Harden has secured the position of overseer of spinning with the Winona Cotton Mills, Winona, Miss.

W. P. Hamrick, for several years connected as overseer with the Granby and the Olympia Mills of Columbia, has entered on his new duties as superintendent of the Richland Cotton Mills of Columbia, S. C.

L. A. Abercrombie has left the Mills Mfg. Co., Greenville, S. C., and taken a position with the Fulton Bag & Cotton Mills, Atlanta, Ga.

Daniel Stott, an overseer at the Whitman Mills, Fall River, Mass., has resigned, after two years' service, and has a similar position with the Butler Mill Company in that city. Mr. Stott was presented with a gold watch and chain upon his resignation.

H. Harden is the new overseer of spinning at the Winona Cotton Mill, Winona, Miss.

C. H. Branson, superintendent of the No. 2 mill of the Highland Park Mill, Rock Hill, S. C., has resigned to accept a similar position with the Fort Mill Manufacturing Company and the Milfort Mill Co., at Fort Mill, S. C. J. P. McNeil, who has been superintendent of the No. 1 mill of the Highland Park Mill, succeeds Mr. Branson.

M. D. Ellenburg has been appointed to succeed Ralph Martin as overseer of the cloth room at the Toccoa Cotton Mill, Toccoa, Ga.

Arnold C. Gardner has severed his connection with the New England Cotton Yarn Company, New Bedford, Mass., and has gone on a pleasure trip to Japan.

A. H. Bosworth, who recently resigned as overseer of carding at the Shady Lea Mill, Allenton, R. I., was presented with a gold headed cane by the employes.

James Harper has resigned as overseer of cloth room at the West Boylston Mfg. Co., Easthampton, Mass.

Joseph Covo, has resigned as overseer of ring spinning in the Wampanog Mills, Fall River, Mass., and is now holding a similar position at the Stafford Mills.

N. F. Harris is now overseer of spinning in Morganton, N. C., Mill No. 1, having resigned his position with the Golden Belt Mills, Durham, N. C.

W. O. Nute, master mechanic at the Palmer Mills, Three Rivers, Mass., has resigned.

E. J. Peterson, overseer of ring spinning at the Boston Mfg. Co., Waltham, Mass., has resigned.

W. H. Rivers, formerly with the Otis Co., Ware, Mass., as overseer of spinning, is now with H. W. Marcy, braid and lace manufacturer, at Providence, R. I.

F. C. Haskell has resigned as superintendent of the Yazoo City, Miss., Cotton Mill, and has been succeeded by Mr. Milstead, Tallahassee, Ala.

J. C. Mathes, who recently returned to superintend the Cannon Mills, Concord, N. H., has again resigned on account of ill health.

Dean Sutliffe has been engaged as superintendent of the new mill now nearing completion of the Arcadia Cotton Mills Co., Spartansburg, S. C.

F. L. Moble, formerly of Forsyth, Ga., becomes superintendent of the Waynmanville (Ga.) Cotton Mill.

Clinton S. Amden, Providence, R. I., has been elected to succeed F. M. Messenger as agent of

the Grosvenor Dale Co., North Grosvenordale, Conn.

H. B. Isley, boss dyer at the Bellevue Cotton Mills, Newport, Tenn., has resigned, and is now with the Worth Mfg. Co., at Central Falls, N. C.

Dean Sutcliffe, late of Overland Mills, Denver, Col., has taken the position of superintendent of the Arcadia Mills, Spartanburg, S. C., to begin operations at an early date.

L. B. Sanford, formerly superintendent of the Wampanoag Mills, Fall River, Mass., has accepted the position of superintendent of the Kennebec Spinning Co., Richmond, Me.

A. C. Pender of Cowpens, S. C., has been engaged as superintendent of the Brenham Cotton Mills Co., Brenham, Texas.

Paul Pelletier, overseer of ring spinning department of the Shove Mills, Fall River, has resigned. Napoleon Fisher of the Parker Mills, Warren, is his successor.

F. J. McCusker has been engaged as superintendent of the bleaching department of the Monadnock Mills, Claremont, N. H.

W. L. Beyer, formerly superintendent of the Phoenix Mill of the Mount Vernon-Woodberry Cotton Duck Co., and J. F. Scott, assistant superintendent of the same plant, have accepted positions with Morris & Co., the Groveville Mills, Yardville, N. J.

W. H. Bracewell, Fiskdale, Mass., has been appointed master mechanic of the Harmony Mills, Cohoes, N. Y.

Thomas Mungall, superintendent of dyeing at the Amoskeag Mfg. Co., Manchester, N. H., has resigned and gone to Pell City, Ala.

Woolen.

John E. Hall, who had charge of the burling and mending at the Brightwood Mfg. Co., North Andover, Mass., has been promoted to finisher, succeeding George Junger.

T. J. Sheehan has accepted a position as overseer of carding at the plant of the Webster Woolen Company, Sabattus, Me.

Henry C. Templeton, Collinsville, Mass., is now in charge of finishing at the Irvington Woolen Mill, Chester, Pa.

Charles O. Stearns, formerly treasurer, has been elected President of the Schaghticoke (N. Y.) Mills Co., succeeding the late Steven Ingalls. Stearns Ingalls, son of the late Mr. Ingalls, who was secretary, has been made treasurer.

David Micklejohn is engaged as cloth inspector with Graham, Clark & Co., Adams, Mass.

Oliver S. Merchand, for seven years boss weaver at the Tilton Woolen Mills, Tilton, N. H., has resigned, and taken a similar position in the Elm Mills.

Charles Goehsirg, formerly of the Rock Mills, Rockville, Conn., is now overseer of weaving for Helliwell & Co., Pittsfield, Mass.

H. K. Martin, superintendent of the Burtworth Carpet Company, Chicopee, Mass., has resigned.

Randolph D. Shaw, Wales, Mass., has been promoted from second hand to overseer of finishing in the Berkeley Mills.

William Taylor has severed his connection with the Byfield, Mass., Woolen Co., and is now engaged in promoting the interests of the Boston Electric Spinning Co., a new concern to build and sell an electric spinning mule.

W. L. Clements has resigned as cloth examiner at Holden, Leonard & Co.'s mill, Bennington, Vt., to accept a similar position at Ware, Mass.

Louis A. Anderson, who has resigned as superintendent of the mill of the American Woolen Company, Fairfield, Me., to accept a similar position with the River Spinning Company of Woonsocket, R. I., will be succeeded by S. C. Hall of Bound Brook, N. J. Mr. Hall is expected to assume his duties about June 1st.

M. Burke has resigned as overseer of finishing for the Jefferson Mfg. Co., Jefferson, Mass.

W. F. Shaw, who recently accepted the position of superintendent of the Assawaga Company, Dayville, Conn., which will operate the Dayville Woolen Co.'s plant, was not formerly superintendent of the Coburn Woolen Mills, Lewis Anderson &Co., Skowhegan, Me. He went to the Anderson Mills of the American Woolen Company in June, 1900, which was his first connection with them, but not as superintendent.

Arthur H. Vince ,formerly of Dover, N. H., is cloth inspector at the Cocheco Mills, East Rochester, N. H.

A. P. Foster has resigned as overseer of weaving at the Tilton Mills, Tilton, N. H.

A. W. Kennedy, formerly of Philadelphia, is in charge of carding at the Hewson Woolen Mills, Amherst, Nova Scotia.

Herbert Schofield, formerly of Fitchburg, Mass., has been appointed designer for the American Woolen Mills, Rockville, Conn.

David Byers has resigned his position as overseer of weaving at the Saranac Worsted Mills, Blackstone, Mass.

Joseph H. Carroll, formerly engaged with different large Philadelphia worsted yarn mills, is now superintendent of the Manningham Worsted Company, Germantown, spinners of worsted yarns by the Bradford system.

Peter S. Plouff, formerly superintendent of the Walter F. Scott Woolen Co., Dexter, Me., has accepted a similar position for the Webster Woolen Mills, Sabattus, Me.

S. S. Welch, formerly agent of the American Woolen Co., Franklin, Mass., has been appointed superintendent of the Conshohocken Woolen Co., West Conshohocken, Pa.

James H. Barnett, overseer of dressing, spooling and twisting for the Worcester (Mass.) Woolen Mills, has accepted a similar position with the American Woolen Co., Fitchburg, Mass.

E. H. Heine, formerly of Yantic, Conn., is now overseer of weaving at the Saranac Mills, Blackstone, Mass.

Oliver Merchant, overseer of weaving at the Tilton Mills, Tilton, N. H., has resigned.

R. A. Latimer has been engaged as superintendent and designer of the Abbot Woolen Co., Dexter, Maine.

E. E. Bigelow, Tilton, N. H., has taken charge of spinning at Mascoma Mill, Lebanon, N. H.

Henry A. Cole has taken charge of finishing at the Verd Mont Mills, Ludlow, Vt, He was formerly of Nasonville, R. I.

Michael J. Shaughnessy, for many years superintendent of the Bottomly Mill, Cherry Valley, Mass., has severed his connection with the same, and leaves for Ireland on June 4th.

J. F. Driscoll has resigned his position as overseer of weaving for the Dawson Mfg. Co., Hollis-ton, Mass.

James Lyme is the new agent of the Ray Woolen Mill of the American Woolen Co., Franklin, Mass. Mr. Lyme was formerly at the Assabet Mills, Maynard, Mass.

George W. Sidebotham has been elected president and James Marck secretary and treasurer of the Abbott Mfg. Co., Philadelphia, Pa., succeeding President Frederick C. Brunhouse and Secretary and Treasurer Charles A. Fessler.

James T. Patterson, finisher in the Berkeley Woolen Mills, Wales, Mass., for upwards of 15 years, has resigned. Mr. Patterson will take charge of the finishing in the Empire Woolen Mills, Clayville, N. Y.

William E. Davison, who recently resigned from the superintendency of the mills of the Calumet & Hecla Company, Uxbridge, Mass., was presented by the employees and overseers of the mill with a diamond ring.

Benjamin F. Smith, general manager for J. Walworth & Sons, Upland, Penn., shoddy manufacturers, has resigned, and will take a much needed rest.

Gustav Hager, for a number of years overseer of weaving at the Standish Mills, Plymouth, Mass., has resigned to accept the position of assistant superintendent at Lymansville, R. I.

John Lawton, who recently came to this country from England is the new dyer at the Hampden Mills Co., Hampden, Mass.

James Halliwell, dyer at the Hartford Carpet Corporation, Thompsonville, Conn., has resigned.

Ernest Potter, boss shearer at the Fulton Worsted Mills, Fulton, N. Y., has resigned to become head finisher in the mill at Auburn prison. Thomas Sweeney has succeeded him.

L. H. Fitch, who has represented the yarn department of the Arlington Mills for several years, has severed his connection with that company, and has established a commission business at 157 Federal St., Boston, Mass. He has been appointed selling agent for the Moore Spinning Company, North Chelmsford, Mass., and the Saxony Mills, Newton, Mass., and will have entire management of the selling of the yarns of these concerns.

Thomas E. Ainley, overseer of carding, has severed his connection with George Hinchcliffe & Son, Clayville, N. Y.

Deaths.

Henry L. Aldrich, president of the Aldrich Mfg. Co., Moosup, Conn., died May 4th. In 1881 he leased the Baltic Mill and conducted its operations for six years, and in 1888 bought the cotton mill at Moosup, which he has since run with his three sons. He was well known among mill men and highly respected by the many with whom he came in contact.

Oliver Allen, Mumford, N. Y., died at the home of his son in Brooklyn, N. Y., May 4. Mr. Allen established the Oatka Woolen Mills in Mumford, and his sons Leonard and Allen succeeded him in the business. Leonard established the Allen Woolen Mills at Rochester. Mr. Allen was a citizen of much public spirit, and he identified himself with all matters pertaining to the welfare of the community in which he lived.

Edward D. Thayer, for many years one of the leading satinet manufacturers of New England, died at his home in Worcester, Mass., May 12th. He was born at Blackstone seventy-one years ago, and engaged in manufacturing at Millville, Webster, Cherry Valley and Lawrence.

Samuel Firth, former superintendent of the Rochdale Mills, Rochdale, Mass., for twenty years, died May 2nd. Mr. Firth was one of the oldest residents of Worcester County. He was born in Leicestershire, England. When six years old he came to this country with his parents, who settled in what is now Leicester, but which was then known as New Rochdale. He retired about twenty years ago.

J. B. Johnson, superintendent of the finishing department of the Saxonville Woolen Mills, Saxonville, Mass., died May 7th, aged 66 years.

Edward R. Handy, one of the owners of the Contrexville Mfg. Co. at Manville, R. I., died at midnight April 30th, after a comparatively short illness. Mr. Handy was born in Wilkins Falls, N. Y., in 1861. He had been a resident of Manville for many years and was associated with his brother, Thomas H. Handy, in manufacturing plush goods. He was held in the highest esteem, and much regret was expressed at his death.

Charles H. Abbott, a well-known wool broker, of San Francisco, Cal., died recently. Death was the result of heart disease. At the time of his death, Mr. Abbott was 52 years of age. He was born in Lowel, Mass. In 1879 he opened an office as purchasing wool broker for a number of large Eastern woolen mills, and had been up to the time of his death an influential factor in the wool market on the Pacific Coast.

New Publications.

Silk Calculator; by John J. Ruegg; price $5.00.

Since 1893, when this work first appeared, four other editions have been issued, each being carefully revised. The present edition, which is the fifth, is therefore presented to the trade with every confidence on the part of the author that it embodies practically all of the calculations that the silk manufacturer finds necessary to make in his mill. The author's motto is: "In calculation lies success," and every textile manufacturer will subscribe to this sentiment.

Following is an abstract of the table of contents:

Analysis and Calculation of Silk Fabrics; Yarn Calculations in Cotton, Woolen, Linen, Worsted, Silk and Spun Silk; Explanation of Billeter's System of Lightening Calculations; Calculations of Silk in Twelve Different Articles and Qualities; Calculations on Blanks; Warp Weight Tables of Raw or Thrown Silk and Cotton or Spun Silk; Filling Weight Tables of Tram, Cotton or Spun Silk Yarns; Wages Table; Piece Work Wages Table; Table of Sizes in Thrown Silks; Comparative Yarn Tables of Cotton, Woolen, Linen, Worsted, Silk and Spun Silk Yarns.

No stronger proof of the merit of this work is needed than the repeated editions which the demand has made necessary. The work can be obtained at this office.

Dyers' Materials: by Paul Heermann, Ph. D.; D. Van Nostrand Company, New York City; price $2.50.

This is a translation of a German work treating of the examination of chemical materials used in the textile industry and giving in compact form the most valuable methods and data for the use of chemists. The book is intended primarily for chemists and presupposes the principles of chemical analysis; frequently it only indicates the common methods, bestowing the chief attention upon specific articles and methods of examination. The following abstract of the table of contents gives a good idea of the scope of the work: Indicators; Standard Solutions; Reagents; Water in Textile Fibres; Inorganic Materials; Organic Compounds; Atomic and Molecular Weights; Gravimetric and Volumetric Equivalents.

Two plates are inserted at the end of the book. The first contains a microscopic appearance of the textile fibres and the other the microscopic appearance of the different varieties of starch.

International Yarn Tables; compiled by Matthew Blair of McLennan, Blair & Co., Glasgow, Scotland.

This treatise on yarn numbering has been compiled under the auspices of the Permanent Committee of the International Yarn Congress of 1900, which was held at Paris. We have never seen a clearer explanation of the different methods of yarn numbering than is given in the pages of this little book. There are also included numerous comparative yarn tables which are well arranged and the value of which is enhanced by the judicious use of display type.

English Cotton Spinners' and Manufacturers' Directory; John Worrall, Oldham, England; Published in large quarto and pocket editions; Price, $2.00.

The nineteenth edition of this directory of English mills contains a list of the cotton spinners and woolen manufacturers, bleachers, printers, etc., giving the number of spindles and looms of each concern, counts spun, goods manufactured, pay days, telegraphic addresses and telephone numbers. In addition to the list of manufacturers arranged by districts, a classified list is given by which the firms engaged in each branch of the textile industry are arranged alphabetically. The list of cotton spinners is tabulated, showing at a glance whether they spin fine, medium or coarse counts, and the number of the yarn spun. There are 1,764 firms given in this directory as engaged in the cotton industry in Great Britain.

The Metric System; by F. A. Halsey; American Society of Mechanical Engineers, New York.

This argument against the metric system was read at the meeting of the Society in New York last December, during the agitation over the bill then pending before Congress to compel the use of the metric system in the departments of the government. The author first presents a vast array of evidence to prove the persistence of old weights and measures in so-called metric countries, and the confusion resulting from the use of both the old and metric standards. He shows that the attempt to adopt the metric system has resulted only in disorder. He examines the claims of superiority for the metric system, showing that many of them are unfounded, and others greatly overestimated. Next comes a consideration of the claim that the change of our present weights and measures is necessary to the extension of our foreign trade, closing with an analysis of the bill and of the testimony in support of it.

In an appendix is the oral and written discussion of the paper by both advocates and opponents.

The whole work is a very valuable addition to the literature bearing on the subject of our weights and measures. It was submitted to a committee of the society, who have made an elaborate report. Both the paper and report of the committee have been sent to each one of the 2,500 members with request for answers to a series of questions relating to the metric system. The result of the vote will thus show the sentiment of this the most important association of engineers in the United States regarding this very important question. Mr. Halsey has done much to crystallize the sentiment against any disturbance of our present system.

Business Literature.

Hurricane Dryers; Philadelphia Drying Machine Co., 6721 Germantown Ave., Philadelphia, Pa.

A pamphlet describing and illustrating the various types of "Hurricane" truck and automatic yarn dryers which have proved so efficient in many of our mills.

A B C Exhaust Fans; American Blower Company, Detroit, Mich.

A catalogue illustrating and describing the va-

rious types of steel plate and exhaust fans manufactured by the above named well-known firm. In addition are given many useful tables relating to the weights of iron pipes, areas of circles, etc.

Reynolds Corliss Engines; Allis-Chalmers Co., Chicago, Ill.

This is a book of 189 pages filled with addresses of users of the Reynolds Corliss engines and furnishes striking proof of the popularity of this type of engine. The list includes firms in every state in the Union, engaged in a wide range of industries.

A B C Electric Fans; American Blower Co., Detriot, Michigan.

A leaflet giving the dimensions, speeds and prices of the various types of electric fans built by the above named company

Technical School for Wage Earners; American School of Correspondence, Chicago, Ill.

A catalogue explaining the methods and leading features of the American School of Correspondence. The textile department of this school is located at Boston, where technical instruction by correspondence is given in the manufacture of textiles, and is conducted under the same management as the main school at Chicago, so that students can select branches from the technical course of study along with those that are given with the general course.

Hotel Book Giving Summer Resorts, Railroad and Hotel Rates; published by the Boston & Maine railroad.

"Resorts and Tours 1903" is the title of the valuable little brochure published by the Boston & Maine Railroad Passenger Department, Boston. It contains a list of the resorts and hotels reached by the Boston & Maine Railroad and its connections, giving additional information in regard to the hotel rates and accommodations, the round trip summer excursion rates from Boston, Worcester and Springfield, Mass.

This book is free and will be mailed upon receipt of address.

Removal Notice.

W. T. Lane and Brother, manufacturers of mill baskets, announce their removal from Port Chester, New York, to Poughkeepsie, New York, where they have erected a new factory and equipped it with special new machinery adapted to their line of manufacture. We learn that the change in their location was made necessary by reason of the rapidly increasing demand they are having for the Lane basket, lack of room and proper facilities in the old location, and to conditions which were made especially favorable in Poughkeepsie to induce them to locate their factory there.

The Rome Soap Manufacturing Co.

The Rome Soap Manufacturing Company, Rome, N. Y., manufacturers of all kinds of textile soaps, including fulling, scouring, potash and silk soaps, has had a very active season and is well sold up. There have been some changes in the organization of the company, R. B. Billings having retired and his interests have been purchased by members of the Brown family. Mr. F. W. Brown continues as president of the company, G. H. Brown takes Mr. Billings' place as secretary, L. O. Buckley is treasurer. Mr. Billings has bought the Brown interests in the Utica Dyeing Co., Utica, N. Y.

Proved Belting.

A half century's constant use in thousands of the leading factories of the United States has proven the very great worth of "Royal Worcester" belts.

The Graton & Knight Mfg. Co., Worcester, Mass., has acquired a splendid reputation for their belting by honest work all through this long period of time. Any manufacturer who desires to secure good belting will do well to write for prices and facts about "Royal Worcester."

Albert and Arthur Birch Consolidate Their Business.

For many years Albert and Arthur Birch, twin brothers, were in business together, under the name of Birch Brothers, manufacturing and importing machinery for calico printers, bleachers, cotton, woolen and worsted dyers and finishers. About seven years ago they separated, Albert Birch continuing in Somerville, Mass., under the name of Birch Brothers, more lately called the Somerville Machine Works, while Arthur Birch established the Arlington Machine Works at Arlington Heights, Mass. The lines of machinery manufactured by each were practically similar, and added to the fact that these twin brothers resemble one another so closely that those who do not know them well, are sometimes at a loss to know to which one they are talking, confusion frequently resulted. The news that the brothers have now consolidated their business and formed a corporation under the name of the Birch Brothers Company will be welcomed by the trade.

The Arlington Machine Works will be under the special charge of Mr. Arthur Birch, and the Somerville Machine Works will be under the direct management of Mr. Albert Birch. Orders may be directed to either office, and will receive careful attention. This consolidation strengthens the business of both concerns, and the brothers are receiving the congratulations of their friends.

—The American Blower Co. has recently opened an office at 615 Hale Bldg., Philadelphia, in charge of Mr. Benj. Adams, and another at 318 Frick Bldg., Pittsburg, in charge of Mr. H. P. Curtiss.

Watchman Clock System.

The E. Howard Clock Company, Boston, Mass., has lately installed the following: Watchman clock systems for the American Axminster Industry, Auburn, N. Y., The Stillwater Mfg. Co., Stillwater, Minn.; a large tower clock with bell for the

court house at St. Francisville, La., and a tower clock with 8 ft. dials for the Congregational church at Holliston, Mass. They have also made two special bronze clocks for the interior of the New York Stock Exchange, and erected a fine post clock for the Lorimer Wright Company, Providence, R. I.

J. Hetherington & Sons.

Stephen C. Lowe, 186 Devonshire St., Boston, Mass., has received advices from England that the all metal mule carriage recently brought out by J. Hetherington & Sons, is being adopted by many of the English manufacturers, among whom are Clegg & Sons, Littleboro, and the Vernon Cotton Spinning Company. In both cases the new style of carriage was adopted only after the most thorough tests.

Among other English mills installing Hetherington machinery are the following: Tudor Mills, Ashtonunder-Tyne, carding and spinning machinery for the new mill; Eli Lees & Co., Oldham, combers; Britannia Mill Co., Mossley, new mules to the extent of 120,000 spindles.

Vacation Places Where Health and Quiet, Sport and Enjoyment Can be Found.

The warm weather is fast approaching upon us, and this is the time for the intended vacationist to think about his or her place of recreation and enjoyment for the coming season.

New England first of all appeals to the tourist, and when it strikes him, it generally strikes him rather forcibly, for among the numerous resorts of Maine, New Hampshire, Vermont and Massachusetts, the summer tourist will find everything to suit his or her want and comfort. The hotels are modern, and at the principal summer resorts they have become luxurious palaces. The wealthy visitor who desires to stop at one of these magnificent places with a first-class stable of fast horses attached has but to journey to the White Mountains, to Rockland or Poland Spring, Maine, or to the celebrated Bar Harbor.

The youth who wishes to put in the summer at the favorite game of golf, should visit the mountains and his wish will be consummated; the baseball enthusiast who desires to while away his time at the favorite pastime, baseball, can find his enjoyment at these self-same resorts; the fisherman who prefers the beautiful expanse of a glassy New England lake can find his rendezvous in Winnepesaukee or Sunapee in New Hampshire and Moosehead or the Rangeleys in Maine; the hardy mountain climber who wishes to test his skill and endurance in a tramp will find the lofty summit of Mt. Washington waiting for him, or the less fatiguing climbs to Mt. Monadnock or Mt. Saddleback; the yachtsman who finds his joy in a stiff wind and a good boat, can battle with the snowy waves from Marblehead to Bar Harbor; the canoeist can paddle his bark through the poetic waters of the busy Merrimac or through the pine lined streams of Maine, chief of which are the Penobscot and Kennebec; the man who likes life and sport at all times and who desires the free atmosphere of the country and all the health-giving accompaniments, but who desires a bit of city with him, should visit Saratoga. He can find life and amusement to suit the most fastidious taste; he can enjoy the excitement of the race track and the quiet of the mountain valley.

Choose your resort, there are hundreds of places on the line of the Boston & Maine Railroad.

Send to the Boston & Maine Railroad Passenger Department, Boston, for their 1903 Tour Book. It contains 84 pages of useful information, the hotels and their rates and accommodations and the round trip railroad rates from Boston, Worcester, and Springfield. This book will be mailed free to any one upon receipt of address.

Henry J. Ballou.

Stephen C. Lowe, 186 Devonshire St., Boston, Mass., has engaged Henry J. Ballou to take charge of the Boston office. Mr. Ballou has for many years been connected with the firm of Oliver Ditson Company.

Allis-Chalmers Company.

Among the engine sales received during April by the Allis-Chalmers Company we note the following: American Steel & Wire Co., Shoenberger Works, Pittsburg, Pa., one 46 and 84x60 vertical standard long crosshead Bessemer blowing engine, one 80 and 84x60 vertical standard L. P. furnace blowing engine; C. A. McDonald, Chicago, Ill., one 16x30 girder frame engine; Thomas A. Anderson & Co., Lancaster, Pa., one 10x30 girder frame Reynolds Corliss engine; James M. Arnold, 34 West Monroe St., City, one 16x36 1890 frame Reynolds Corliss engine; El Oro Mining & Railway Co., Ltd., Mexico, one 20 and 40x42 1890 tandem compound Reynolds Corliss engine; Harrison-Walker Company, Pittsburg, Pa., one 22x48 1890 frame Reynolds Corliss engine; Marcus Bernheimer Milling & Mercantile Co., St. Louis, one 24x46 girder frame Reynolds Corliss engine; Kingsford Foundry & Machine Works, Oswego, N. Y., one 20 and 14x42 1890 half duplex air compressor; Valley Oil Mills, Memphis, Tenn., one 18x36 girder frame Reynolds Corliss engine; Wheeling Steel & Iron Co., Wheeling, West Va., one 44 and 84x60 vertical standard blowing engine; Cunningham, Beckeheimer Supply Co., Norborne, Mo., one 12x36 1890 frame Reynolds Corliss engine; W. A. Jones Foundry & Machine Co., Chicago, one 14x36 girder frame Reynolds Corliss engine; Larson & Greenough, Mullan, Id., one 10x30 girder frame Reynolds Corliss engine; Jones & Laughlins Steel Co., Pittsburg, Pa., one pair 44 and 84, 84 and 84 by 60 vertical standard compound disconnected blowing engines, one 44 and 84x60 H. P. engine; National Biscuit Company, New York City, one 20x42 1890 frame Reynolds Corliss engine; C. A. McDonald, Chicago, one 12 and 22x36 Tandem Compound engine; Diamond Match Company, Chico, Calif., one 32x48 1890 Reynolds Corliss engine; Jones & Laughlins Steel Company, Eliza Furnaces, Pittsburg, Pa., three 46 and 85, 84 and 84 by 60 vertical steeple cross compound condensing furnace blowing engines; Highland Park Manufacturing Company, Charlotte, North Carolina, one 30 and 64x60

1890 cross compound engine with boilers, condenser, piping, etc.; City of Ely, Ely, Minn., one 14 and 28x36 1890 frame, cross compound Reynolds Corliss engine; Mr. Charles Pope, Chicago, two 12x36 and 18x36 1890 frame horizontal Reynolds Corliss engines; National Tube Company, McKeesport, Pa., three 46 and 86, 84 and 84 by 60 vertical steeple cross compound furnace blowing engines; Carnegie Steel Company, Pittsburg, Pa., two pairs 44 and 84, 84 and 84x60 vertical standard, disconnected compound blowing engines; National Steel Company, Pittsburg, Pa., two 50 and 96, 96 and 96 by 60 vertical steeple cross compound furnace blowing engines; Norowebb Cotton Mill Co., Dallas, N. C., one 20x42 1890 frame horizontal Reynolds Corliss engine; Smeeths's Copper & Bronze Company, Chicago, Ill., one 14 and 28x24 vertical cross compound cond. dir. con. eng., one 12 and 24, 12 and 20x36 air compressor; Wheeling Steel & Iron Company, Wheeling, West Va., one 44 and 84x60 vertical standard blowing engine; Construction Company of America, New York City, two 20 and 40x42 1890 frame horizontal cross compound Reynolds Corliss engines; Grand Rapids Veneer Works, Grand Rapids, Mich., one 32x48 1890 frame horizontal Reynolds Corliss engine; Munising Paper Company, Ltd., Munising, Mich., two 20x36 1890 frame horizontal Reynolds Corliss engines.

—Morris & Co., Yardville, N. J., have added several new machines to their duck basket department. This is a branch of their business which is growing rapidly, as the textile mills have been quick to see the usefulness and the serviceable qualities of their baskets.

The Berry System Applied to Drying and Carbonizing.

Within the past few years an entirely new field has been created for the Berry wheel. The success attending early installations of the Berry wheel for drying and carbonizing has induced the manufacturers to study and develop means and conditions with the view of bringing them to a point where a positive system has been evolved, which is applicable to any make of dryer or tentering machine without changing its general construction.

Their proposition is a bold one and is set forth in a circular recently issued, viz., to guarantee to increase the capacity of any drying machine or room not less than 25 per cent. by the Berry system. This is a broad statement, but it is followed up by specific instances where the names and results are given in different installations covering cloth dryers, cloth carbonizing, drying and carbonizing rags, and yarn dryers. Some of the results are remarkable, and no manufacturer can fail to be interested in the statements set forth in this circular.

—Mr. C. T. Wilkinson, representing the Hygienic Fleeced Underwear Co., of Philadelphia, with offices at 160 Adams St., Chicago, says that he is prepared to handle an account in winter underwear which will not conflict with the summer bathing suits, etc., which he is now handling.

Change of Address.

The Arabol Mfg. Co., who make everything in the way of sizings for textile fabrics, as well as starches, dextrines, soap, etc., have removed their offices from 155 to 100 William St., New York.

English-Greene Co., Providence, R. I.

The English-Greene Company, recently incorporated under Rhode Island laws with a capital stock of $100,000, is a firm of commission merchants with their main offices at Providence, R. I., and branch offices in New York and Philadelphia. This company is making rapid development and their progress is due entirely to the progressiveness and push of the gentlemen interested. They are conducting a general commission business in yarns and cloths, and have already made for themselves a very enviable reputation. They are all men of experience and we predict a great future for them.

Their main offices are located in the Greene Building, Providence, R. I., where they have opened a commodious suite, and where they will be glad at all times to see mill men interested in their product. Their New York office is at 53 Leonard St., the yarn department being under the management of Mr. Frank K. Ney, and the cloth department under the management of Mr. E. W. Levett, both men of wide acquaintance, and well known to the trade. The Philadelphia office at 300 Chestnut St. is in charge of Mr. Benjamin Corwin, who has long been favorably known in the Philadelphia markets. They represent some of the best mills in the South and East, and are in a position to give their customers the best service possible.

Correspondence is solicited from spinners desirous of representation in this market, and liberal advances are guaranteed by them against all consignments. All their goods will be sold under a registered trade-mark consisting of "E. G." enclosed within a diamond. Any business entrusted to their care will receive prompt and satisfactory attention.

Increased Demand.

The Lunkenheimer Company, Cincinnati, report that on account of the unprecedented demand for their superior line of brass and iron steam specialties, they have been compelled to increase their foundry output 50 per cent. Machine tools of the most improved type are being installed in various departments as fast as they can be obtained.

—L. T. Houghton of Worcester, Mass., is equipping 13,000 spindles at the Grosvenordale Co., North Grosvenordale, Conn., with his new steel thread board and steel rail. It is found that with the steel rail much time is saved in going back to the lifter. This new rail is balanced and it is estimated that the time saved in going back and forth to the lifter and doffing ought to pay the whole cost of the rail twice over in the course of a year.

—The Hastings (Mich.) Wool Boot Co. are installing a dryer furnished them by the American Blower Co. of Detroit, Mich.

Evening Class.

The graduating exercises of the Lowell Textile School were held on May 14. The occasion was especially noteworthy by reason of the presence of the first woman graduate from the evening school, Miss Martha Balmforth of Billerica, Mass., who has attended the school two evenings a week for three years. Following are the members of the graduating class:

Cotton spinning course, three years—Charles Lawrence, F. E. Knowles, F. A. Upton, M. H. Varney, George Goodchild, F. A. Mason.

Worsted spinning, two years—J. J. Keleher, Wilfred Lord, Fenton Schoon, Richard Nicholson.

Woolen spinning, one year—H. D. Rockwell, J. H. Balmforth, J. A. Higgins, A. J. Baxter, A. C. Guant.

Designing, three years—Martha Balmforth, E. J. Barry, H. Bastow, W. Gardner, J. Howard, C. W. Hortenson, J. W. Myers, D. T. Noonan, G. B. Palmer, J. S. Schofield, M. Tonge, J. J. Jennings.

Post graduate, designing—A. L. Moir, David Walker.

Chemistry, four years—J. W. Myers, B. J. Stokham.

Weaving, two years—R. Hunter, S. L. Johnson, D. J. Cady, J. W. Leach, F. T. Donnellan.

Mechanical engineering, two years—W. S. Byam, J. J. Flynn, Finley M. Gray, H. L. Lincourt, A. Mozley.

Among the speakers were President A. G. Cumnock, J. L. Chalifoux, A. K. Whitcomb, Principal W. W. Crosby, and Thomas Walsh. Principal Crosby presented the diplomas.

Ramie Yarns.

Frank A. Tierney, 260 West Broadway, Wool Exchange Bldg., New York, has been meeting with much success in introducing the ramie tops and noils for which he has the exclusive American rights. He has the agency for European manufacturers who have made the greatest success of working ramie, and is in a position to furnish a regular supply of material under contract and can guarantee uniform grade. He has recently made arrangements whereby he can supply ramie yarns for all purposes and in all numbers, and invites correspondence.

Keystone Belts.

The Keystone Leather Belting Works, Norristown, Pa., make a belt which users say is unsurpassed. They pay especial attention to selling a belt for the place where it is to run. They are also belting doctors, and when belts are oil soaked, they will degrease them, or if they are dried out, they will treat them to make them pliable and almost as good as new. One of their specialties is the Keystone leather belt dressing, which has been widely sold and is popular with power users.

Messrs. Johnson & Johnson, New Brunswick, N. J., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

Knitting Machinery.

The largest stock of second-hand knitting machinery in the country may be seen at the office and warehouse of James Taylor, 835 Arch St., Philadelphia. Among the stock are some of the very latest improved and almost new machines, and at the reduced prices at which they are offered, are great bargains.

Mr. Taylor is doing business with almost every country of the world where knit goods are made. He has the advantage of being in position to do business direct with the manufacturers of foreign countries and in their own language.

His advertisement, which appears regularly in the Textile World Record, gives a short list each month of specially attractive bargains and latest arrivals in the way of machinery, and if knitting mill men note this list each month, they are pretty sure to pick up good bargains.

A new catalogue of second-hand machinery has just come from the press, and copy of same will be sent to those asking Mr. Taylor for it.

The New Jersey Central's New Suburban Book.

To interest the thousands of hived-up Gothamites who ought to be "Suburbanites," the New Jersey Central has prepared a booklet of 48 pages, entitled: "Within the Suburban Limits." The book is printed on the best of paper and has over 50 half-tone engravings. The territory described is all within 35 miles of New York, and the information contained includes rates of fare, train information and details regarding schools, churches, social environs, health advantages, and in fact no details are lacking such as are demanded by the home seeker. The book will be forwarded to your address upon receipt of 4 cents in stamps by C. M. Burt, Gen'l Passenger Agent, New Jersey Central, New York City.

Early Spring at the Seashore.

In a hundred ways conditions at the seashore have changed. The time was when one never considered that the shore could be visited until the hot season of July and August, first because of the supposed miserable weather, and because there were no hotel accommodations for those who dared a visit, nor were there any attractions in the amusement line. Of course the Southern and Florida resorts were in bloom, but in May and June the weather was far from delightful, and for the busy man who delights in a day or two's outing during these charming months Florida was out of the question. Then Atlantic City came to the front. A superb climate, magnificent hotels, entertainment galore, and all within three hours of New York, and at the shore too what more could you ask.

Atlantic City at the present time is the ideal spot, its temperature averaging in the seventies, when overcoats and heavy clothing are unnecessary. The ocean breezes are most exhilarating and bracing, and the board walk is thronged with a happy crowd. Down at the inlet two score of craft are in

commission for delightful pleasure cruises along the shore. The several big ocean piers are alive and entertainment is provided for young and old in the form of theatricals, concerts, cakewalks, basketball games, dancing and like diversions. The bazaars on the board walk are all open and from the inlet to Chelsea there is an incessant liveliness. Atlantic City was made famous by its marvelous hotels, and every one of the beach front hostelries numbering fully a score and accommodating fully 20,000 guests, is open for the reception of visitors. These hotels cater to your every demand, and nothing is left undone which will make you happy and comfortable.

The cuisine in every instance is equal to that of the fashionable metropolitan houses, and when you consider the fact that Atlantic City is but 3 hours distant from New York by the New Jersey Central, it can be readily imagined that Atlantic City is the leading resort for May and June, as well as the seasons. The New Jersey Central has vestibuled trains with buffet Pullman's from its Liberty Street Station, New York, at 9.40 a. m. and 3.40 p. m., and if you want to know about Atlantic City send a postal to C. M. Burt, G. P. A., New Jersey Central, New York City, Room 8, for booklet, free for the asking.

Factory Locations.

The Manufacturers' Exchange, 277 Broadway, New York City, is organized for the purpose of aiding manufacturers throughout the country in securing suitable locations for their establishments. They are posted on the different advantages of various localities and know what inducements are offered to manufacturers. They work without publicity, and this is a very desirable feature, because where manufacturers are obliged to conduct their investigations in person, it soon leads to newspaper publicity, which is undesirable and frequently embarrassing to all those concerned. They act as industrial agents for cities, towns and boards of trade which are seeking to secure manufacturing enterprises. G. M. Vescelius, the general manager, has had long experience in confidential negotiations, and refers by permission to many prominent New York houses connected with the textile industry and other branches of business. A booklet has been prepared, which may be had upon application by those interested.

--The Baldwin Locomotive Works has sent to the Burt Mfg. Co., Akron, O., its sixteenth order for exhaust heads, to be used in its own works.

—Two large Cross oil filters were recently sent to the U. S. Steel Corporation from the Burt Mfg. Co., Akron, Ohio. This makes a total of 114 Cross oil filters now in use by the Steel Corporation in its different mills.

--A very large Cross oil filter has been ordered by the B. F. Goodrich Co. to be used in connection with a Westinghouse steam turbine engine. The Burt Mfg. Co. are the makers of the Cross Oil Filters.

National Association of Woolen and Worsted Overseers.

The twentieth semi-annual meeting of this association was held at the Quincy House, Boston, May 20. A large number were in attendance. After the meeting had been called to order by President C. M. Hurst of Providence, R. I., a number were admitted to active and associate membership. A discussion of topics of interest to the textile industry then followed. The meeting closed with a banquet in the afternoon. Following is a list of the new members admitted at this meeting:

J. William Whitehead, weaver, Maynard, Mass.; Chas. E. Pfiiegl, spinner, Cleveland, Ohio; S. S. Stiles, superintendent, Middletown, Conn.; J. Clark Partelo, carder and spinner, Rochdale, Mass.; W. H. Broadhead, superintendent, Hampden, Mass.; Charles A. Kennedy, dyer, Newburgh, N. Y.; Wm. P. Simons, finisher, Wales, Mass.; P. J. Harney, Pittsfield, Mass.; James A. Towle, carder, Seneca Falls, N. Y.; Robert E. Horan, finisher, Milbury, Mass.; W. P. Clevinger, finisher, Seneca Falls, N. Y.; Peter Stitt, dyer, Broad Brook, Conn.; Thomas J. Kelly, carder, Ludlow, Vt.; C. C. Jones, finisher, Uxbridge, Mass.; John E. Graham, dyer, Lowell, Mass.; Clarence L. Jackson, finisher, Ludlow, Vt.; Arthur P. Smith, carder, Byfield, Mass.; James A. Clark, carder, Holyoke, Mass.; J. H. Fitzroy, finisher, Fitchburg, Mass.; Chas. O. Geer, spinner, Lafayette, R. I.; James Speed, Boston, Mass.; Theodore Wilmot, spinner, West Concord, N. H.; M. J. Dwyer, carder, Nasonville, R. I.; John J. Burns, weaver, Nasonville, R. I.; A. J. Wicks, dresser, Nasonville, R. I.; Thos. N. Gordon, carder, Whipple, R. I.

Thirteen Beautiful Descriptive Books for 26 Cents.

In the list of literature published by the Boston & Maine Railroad Passenger Department are thirteen books entitled: "The Merrimack Valley," "Among the Mountains," "Lakes and Streams," "Lake Sunapee," "Lake Memphremagog and About There," "Southeast New Hampshire," "Southwest New Hampshire," "Hoosac Country and Deerfield Valley," "Valley of the Connecticut and Northern Vermont," "All Along Shore," "Central Massachusetts," "The Monadnock Region," "Fishing and Hunting."

The books give a delightful description of the different resorts of New England, each book containing from thirty to sixty pages of interesting reading matter and beautiful illustrations.

One of these books will be mailed upon receipt of two cents and the whole set will be mailed upon receipt of twenty-six cents in postage by the General Passenger Department, Boston & Maine Railroad, Boston.

—The Edison Phonograph Works, Orange, N. J., has just sent its third order to the Burt Mfg. Co., Akron, O., for exhaust heads. This goes to show that the Burt exhaust heads are very satisfactory to the user.

Textile Patents.

ISSUED APRIL 28, MAY 5, 12 AND 19.

COMBERS. Cam-Race Pin for Cotton Combers. 728,431. Allen C. Arey, Jr., Utica, N. Y., assignor of one-half to Lafayette Hannas, Utica, N. Y.

DYE AND MAKING SAME. Blue Basic. 726,667. Emile A. Fourneaux, New York, N. Y., assignor to Herman A. Metz, Brooklyn, N. Y.

DYE, BLACK AZO. 726,695. Myrtil Kahn, Elberfeld, Germany, assignor to Farbenfabriken of Elberfeld Co., New York, N. Y.

DYEING MACHINE, SKEIN. 727,775. William H. Fletcher, Paterson, N. J.

DYEING AND PRINTING. In Anilin Black. 727,292. Friedrich Cliff, Rauenthal, near Barmen Ritterhausen, Germany.

FABRIC FINISHING MACHINE. 727,443. Marius Ratignier and Marius Clerc-Renaud, Lyons, France.

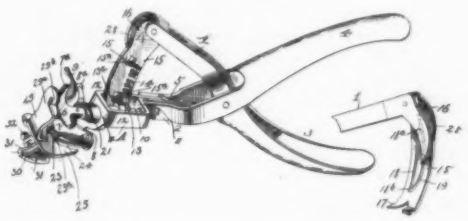
FABRIC FOLDING MACHINE. 727,304. Andre Dauvergne, Lyons, France.

FABRICS. Thread and Cord Edge Finish for. 726,311. Hermann A. Klemm, New York, N. Y., assignor to Sophie Hessel, Sheldon, Conn., and Amelia Hessel, New York, N. Y.

INDIGO MIXTURE and Process of Making Same. 726,688. Benno Homolka, Frankfort-on-the-Main, Germany, assignor to Farbwerke, vorm. Meister, Lucius & Bruenig, Hoechst-on-the-Main, Germany.

KNOTTER. 727,424. Olof W. Orell, Minneapolis, Minn.

This invention relates to knotters, and its object is to construct a hand-tool by means of which



a string may be knotted to secure it around a bundle, bale or package. The operating parts of the tool are all carried by two movable jaws, an upper and a lower jaw (designated 1 and 2, respectively), which jaws are operated by handles 3 and 4. A spring, 5, mounted between the jaws serves to hold them normally in a separated position.

LOOM. Filling Replenishing. 726,978. Jonas Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Filling Replenishing. 727,014. Alfred E. Stafford, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Filling Replenishing. 726,518. William F. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass

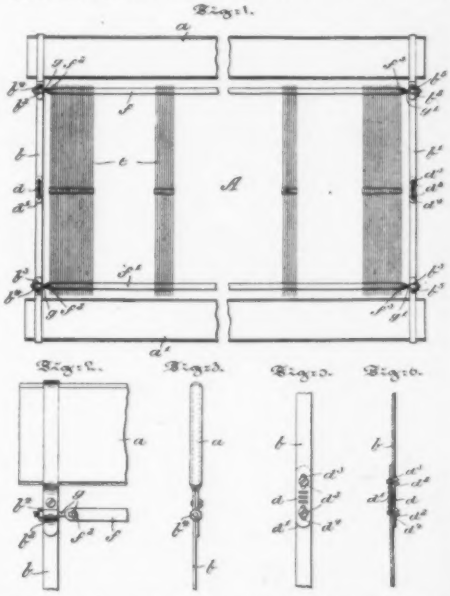
LOOM. Filling Replenishing. 726,574. Charles F. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Filling Replenishing. 726,576. Orren A. Sawyer, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Filling Replenishing Mechanism. 726,493. Bingham F. S. Austin, Gastonia, N. C., assignor to Draper Co., Hopedale, Mass.

LOOM HARNESS FRAME. 726,417. William Fehr, Philadelphia, Pa., assignor to Steel Heddle Manufacturing Co., Philadelphia, Pa.

This invention has relation to a harness-frame for



looms and in such connection it relates to the construction of the harness-frame with special reference to the arrangement of the heddle bars or rods as to the manner of supporting and detaching the said bars or rods carrying the heddles of the harness and of taking up slack in said bars or rods both vertically and longitudinally.

LOOM HEDDLE. 728,055. John Walker, Philadelphia, Pa., assignor to Charles Ashoff Weavers' Supply Company, Philadelphia, Pa.

LOOM LET-OFF and Take-up Mechanism. 727,553. Hiram A. Bond, West Springfield, Mass., assignor by mesne assignments to the National Loom & Wire Co., Springfield, Mass.

LOOM SHUTTLE. 728,371. Henry Cote, Woonsocket, R. I., assignor to Draper Company, Hopedale, Mass.

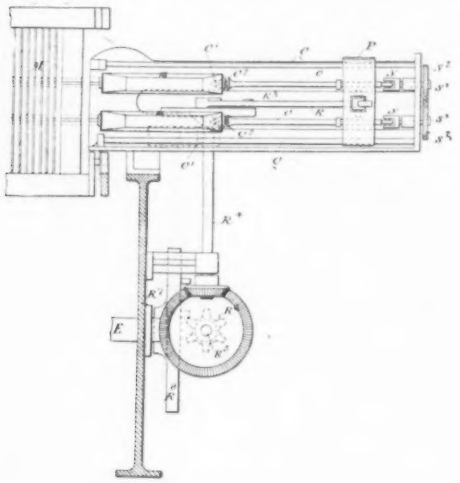
LOOM SHUTTLE. Self Threading. 728,384. George Fair, Salem, Mass., assignor of one half to Edwin W. Gay, Newton, Mass.

LOOM SHUTTLE. Weavers'. 728,694. Eduardo G. Ferreira, Rio Janeiro, Brazil.

LOOM STOPPING MECHANISM. 726,589. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE MOTION. 728,158. Owen Bullock, Hemel Hempsted, and William H. Forty, Boxmoor, England, assignors to Bullock, Forty & Co., Ltd., Hemel Hempsted, England.

This invention relates to shuttle mechanism for looms in which the shuttles are passed to and fro

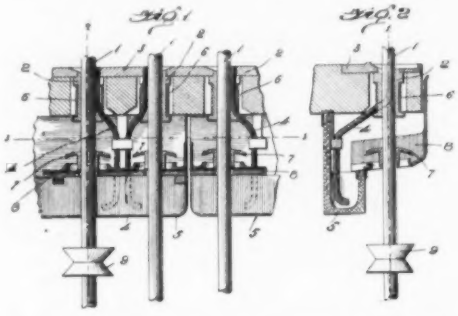


by means of two pusher-rods, one at each side of the loom. According to this invention the shuttle is provided with a spring-clip at each end, and the rods are formed with oblong heads which when turned into one position can pass into and out of the spring-clips without being caught by them, but when turned into another position can be pressed into the clips, but not drawn back from them.

LOOM SHUTTLE. Self Threading. 726,977. Jonas Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING SPINDLE. 728,042. Michael E. Sullivan, New Bedford, Mass., assignor to Sawyer Spindle Company of Maine.

This invention relates to spinning spindles, and has for its object the production of novel, simple, and effective means for preventing the slipping of the yarn carrier or bobbin, or upward displacement thereof, due to centrifugal action. To this end the

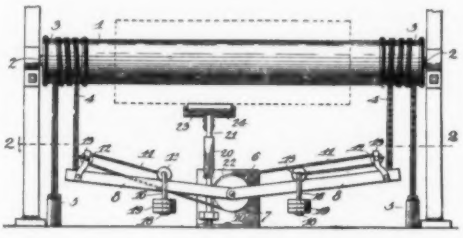


spindle is provided above the whirl with a flexible and preferably elastic disk-like downhold, the periphery thereof frictionally engaging the interior of the bobbin when pushed down into operative position. The application of the bobbin acts to slightly depress the peripheral portion of the downhold, and any slipping or lifting movement of the bobbin relative to the spindle is prevented by the inherent resistance of the downhold.

WARP STOP MOTION. 727,728. Fred A. Whitmore, Dover, N. H., assignor to Draper Company, Portland, Me.

WARP TENSION Mechanism for Looms. 724,471. Henry Hautmann, Phillipsburg, N. J.

The principal object of this invention is to provide an automatic tension device in which the tension on the beam will be gradually decreased as



the threads are withdrawn during the weaving operation, in order that the threads may be held under practically the same tensional strain without regard to the quantity carried by the beam.

WEFT FORK. 724,563. John H. Foster, Fall River, Mass.

YARN GUIDE Controlling Mechanism for Bobbin or Cop Builders. 726,570. Patrick Purcell, Providence, R. I.

C. E. RILEY & CO.

65 Franklin Street, BOSTON, MASS.

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RICHARD THRELFALL, Patent Fine Spinning Mules, 100s to 350s.

HALL & STELLS, Worsted Machinery.

CONSTRUCTION DE MACHINES, Ci-Devant, F. J. Grun. French Worsted Machinery.

HOYLE & PRESTON, Noble Combs, Back Washing Machines, etc.

JAMES TOMLINSON, Ltd., Cotton Waste Machinery; Engine Cleaning and Hard Waste Breaking Machines, etc.

JOHN HAIGH & SONS, Ltd., Woolen and Worsted Cards, Fearnoughts, Feeds, etc,

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L. M. TETLOW & SONS, Card Clothing for Woolen and Worsted; Tempered Steel, Needle Pointed.

J. GREENHALGH & SONS, Cotton Waste Willows, for Fly, Strips, Picker Droppings, etc.

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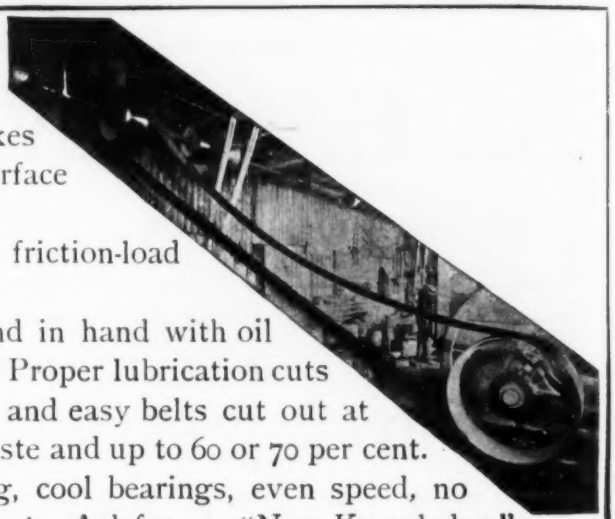

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Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accident Cabinets.
Putnam & Co.

Air Moistening System.
American Moistening Co.

Appraisers.
American Appraisal Co.

Architects and Mill Engineers.
Ballinger & Perrott.
Ferguson, John W.
Gray, Arthur F.
Stearns & Castor.
Suck, Adolph.

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Warren Bros. Co.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Atlas Foundry & Mch. Co.
Harwood, Geo. S. & Son.
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Philadelphia Textile Machinery Co.
Smith, Jas., Woolen Machinery Co.
Woonsocket Machine & Press Co.

Automatic Shuttle and Loom Attachments.
Asala Co.

Automatic Sprinklers.
International Sprinkler Co.

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Torrance Mfg. Co.

Bandings.
——See under Yarns.

Baskets.
Ballou Basket Works.
Lane, W. T. & Bro.
Morris & Co.

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Boston Belting Co.
Dodge Mfg. Co.
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Jeffrey Manufacturing Co.
Keystone Leather Belting Works.
Main Belting Co.
Popham, Henry, & Son.
Shultz Belting Co.
Smith, Jas. Woolen Mach. Co.
——See also Mill Supplies.

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Luther, C. A. & Co.

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——See Tapes and Braids.

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Atlas Copper Stamp Works.

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American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Mass. Fan Co.
Sturtevant, B. F. Co.

Bobbins, Spools, Shuttles, Etc.
Murray, Chas. O.
New England Shuttle Co.
Sweet & Doyle.
Tebbets, E. L. & Co.

Boilers.
——See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Rhode Island Braiding Machine Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass (Perforated).
——See under Perforated Metal.

Brushes.
Felton, S. A. & Son Co.
Mason Brush Works.

Brushers.
——See Napping Machines.
Atlas Foundry & Mch. Co.

Burr Pickers.
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Stoddard, Haserick, Richards & Co.

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Butterworth, H. W. & Sons Co.
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Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

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Carbonizing.
Riverdale Woolen Co.

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——See Automatic Feeds.

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Brown, W. H.

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Curtis & Marble Machine Co.
Howard Foundry & Mch. Wks.
Smith, Jas., Woolen Machinery Co.

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Roessler & Hasslacher Chemical Co.

Chemist.
Austen, Peter T.

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Chaffee Bros.

Cloth Stretchers.
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Blaisdell, Jr., Co., S.
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Seabury, E. R., Co.

Cotton Machinery.
Altemus, Jacob K.
Atherton, A. T., Machine Co.
American Drying Machinery Co.
Ashworth, Elijah.
Barber & Colman.
Brigham, Arthur A.
Brownell, G. L.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Entwistle, T. C., Co.
Fairmount Machine Co.
Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
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Lever, Oswald.
Lowe, Stephen C.
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Philadelphia Textile Machinery Co.
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Saco & Pettee Machine Shops.
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Speed & Stephenson.
Steddard, Haserick, Richards Co.
Stubbs, Joseph.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
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Kitson Machine Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Becker, C. W.
Blaisdell, Jr., Co., S.
Charles, W. B.

Crayons.
Lowell Crayon Co.

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Adams Rib & Top Cutting Co.
Kennedy, Thos. (Cutters, etc.).
Universal Cutter Co.
Wolf Elec. Promoting Co.

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Riggs & Brothers

Dextrine.
Elwell, Henry A. & Co.
Stein, Hirsh & Co.

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American Drying Machinery Co.
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Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
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Philadelphia Textile Machinery Co.
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Smith, Jas., Woolen Machinery Co.
Somerville Mach. Wks.
Sturtevant, B. F. Co.
Textile Finishing Machinery Co.
Drying and Tentering Machinery.
Heathcote, John & Son.
Drying Boards.
Bull, William C.
Dusters.
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Dust Collectors.
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Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Cooper Mercerizing Co.
Cranston Worsted Mills (yarns).
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Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimers, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Molt Bros. (Indigo Blue).
Norwich Processing Corporation.
Pawtucket Dyeing & Bleaching Co.
Pennypack Yarn Finishing Co.
Providence Mills Mfg. Co.
Rothe, O. & P., Man. & Supply Co., Ltd.
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Whittier Mills.
Dyeing, Drying, Bleaching and Finishing Machinery.
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American Drying Machinery Co.
American Yarn Dyeing Machine Co.
Antisdel, E. M. (Knit Dryer).
Birch Bros. Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Dubois, A. N.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fairmount Machine Co.
Gessner, David.
Hopkins Machine Works.
Howard Foundry & Mch. Wks.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Knowles, J. W. & Co.
Leyland, Thos. & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Philadelphia Textile Specialty Co.
Smith, Drum & Co.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F. Co. (Drying).
Textile Finishing Machinery Co.
Dye House Cans.
Hill, James, Mfg. Co.
Dye Sticks.
Bailey, Frank.
Haedrich, E. M.
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Atteaux, F. E. & Co.
Bailey-Rodgers Co.
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Bischoff & Co.
Bosson & Lane.
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Dillon & Co.
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Farbenfabriken of Elberfeld Co.
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Burt Manufacturing Co.
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Borgner, Cyrus, Co.
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Badger, E. B. & Sons Co.
Fire Hose.
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Gas Engines.
Jones, Lewis.
Gas Exhausters.
Sturtevant Co., B. F.
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Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
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Gear Cutting Machine.
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Wisconsin Mfg. Co.
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American Air Moistening Co.
Hydro Extractors.
American Tool & Machine Co.
Brigham, Arthur A.
Riley, C. E. & Co.
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Lunkenheimer Co.
Interior Telephone System.
Allen-Hussey Co.
Stromberg-Carlson Tel. Mfg. Co.
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Craw, J. W., Laundry Machinery Co.
Jacquard Cards.
Rogers, H. E.
Jacquards.
Halton's, Thomas, Sons.
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Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.
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Nye & Tredick Co.
Scott & Williams.
Union Special Sewing Machine Co.
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Paxton & O'Neill.
Ruth Automatic Knitting Machine Co.
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Adams Rib and Top Cutting Mch. Co.
American Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Champion Machine Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Hess, J. Calvin.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kennedy, Thos. (Cutters, etc.).
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Lindley, Geo. W.
Ludwig, E. H.
Mayo Knitting Machine & Needle Co.
McMichael, A.
McMichael & Wildman Mfg. Co.
Mueller, Arthur.
National Automatic Knitter Co.

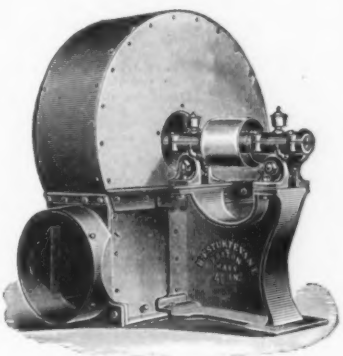
Alphabetical Advertising Index, with page numbers, follows this list.

You can work . . SLASHERS
on any floor of your mill

when a

Sturtevant Fan

is employed to positively exhaust the steam direct from the hoods.



It increases the output and prevents condensation.
Applicable to old or new plants.

B. F. Sturtevant Co.

BOSTON, MASS.

NEW YORK PHILADELPHIA CHICAGO LONDON

213

David Gessner

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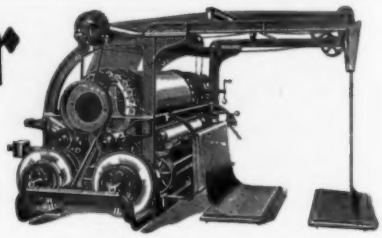
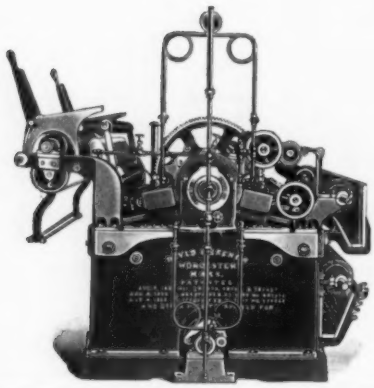
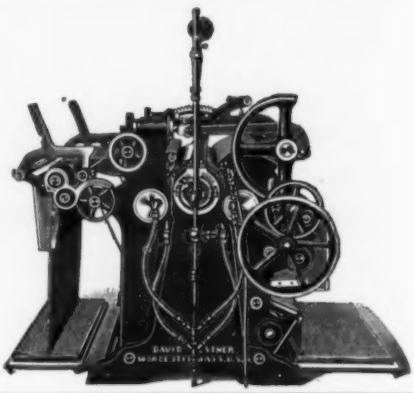




Latest Improved Cloth Finishing Machinery

Napping Machines and Presses a Specialty



Knitting Machinery—cont.
Nye & Tredick Co.
Paxton & O'Neill.
Pepper Machine Works.
Richter, Wolfgang.
Ruth Automatic Knitting Machine Co
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.
Wildt & Co.
Pittsburgh Gage & Supply Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
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Dodge Needle Co.
Ives, Loyal T.
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Ruth Automatic Knitting Machine Co.
Treat, Orion.
Wardwell Needle Co.

Knotter for Spoolers.
Barber & Colman.

Labeling Machine.
Saranac Electrical Mfg. Co.

Laboratory Outfits.
Feidt, Geo. D. & Co.

Leather.
Houghton, E. F. & Co.

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Rogers Paper Mfg. Co., Inc.

Looms.
Asaia Co.
Crompton & Knowles Loom Works.
Draper Company.
Fairmount Machine Works.
Howard Fndy. & Mch. Wks. (For Wire).
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Mason Machine Works.
Smith, Jas., Woolen Machinery Co.
Stafford, George W. Co., The.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

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Beattie's Machine Works.
Hepworth, John W. & Co.
Leighton Machine Co.

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Dixon, Jos., Crucible Co.
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Pittsburgh Gage & Supply Co.

Lumber.
Stearns, A. T., Lumber Co.

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Gerry, George & Son.

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Jefferson, Ed. & Bro.
Pittsburgh Gage & Supply Co.
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Fabric Measuring & Packaging Co.

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Buffalo Forge Co
Mass. Fan Co.
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Buffalo Forge Co
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Chase Pulley Co.
Crosby Steam Gage and Valve Co.
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Dodge Mfg. Co.
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Jeffrey Manufacturing Co.
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Keystone Leather Belting Works.
Lane, W. T. & Bro.
Main Belting Co.
Morris & Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
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Ward & Vandegrift.
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Pittsburgh Gage & Supply Co.

Oils.
Stephenson Mfg. Co.

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Arnold Sewing Machine Co.
Champion Machine Co.
Industrial Manufacturing Co., The.
Merrow Machine Co.
Union Special Sewing Machine Co.
Willcox & Gibbs Sewing Machine Co.
Oxidizing Machinery.
Dubois, A. N.
Packing.
Boston Belting Co.
Paint.
Patton Paint Co.
Standard Paint Co.
Painting Machines.
Patton Paint Co.
Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.
Paper Box Machinery.
Langston, Samuel M.
Paper Tubes.
Sayford Paper Specialty Co.
Patent Solicitors.
Crosby & Gregory.
Howson & Howson.
Jacker, R. J.
Siggers & Siggers.
Straley, Hasbrouck & Schloeder.
Pearl Buttons.
Garbell Bros. Co.
Perforated Metals.
Beckley, A. J. & Co.
Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.
Pipe Covering.
Keasbey, R. A.
Pipes and Fittings.
Pancoast, Henry B. & Co.
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Pneumatic Conveying.
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Portable Hoist.
John E. Larrabee.
Power Transmission Machinery.
Allis-Chalmers Co.
American Drying Machinery Co.
Chase Pulley Co.
Dodge Mfg. Co.
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Fairmount Machine Works.
Howard Founury & Mch. Wks.
Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Oneida Steel Pulley Co.
Pittsburgh Gage & Supply Co.
Philadelphia Drying Machinery Co.
Saginaw Manufacturing Co.
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Smith, Jas., Woolen Machinery Co.
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Preparatory Machinery (Cotton).
Atherton, A. T., Mach. Co.
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Saco & Pettee Machine Shops.
Smith, Jas., Woolen Machinery Co.
Press Boards and Fenders.
Rogers Paper Mfg. Co., Inc.
Presses.
Boomer & Boschert Press Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
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Ramie Tops and Noils.
Tierney, Frank A.
Raw Hide Gears.
New Process Raw Hide Co.
Reed and Harness Manufacturers.
American Supply Co.
Walder, J.
Reels.
Luther, C. A. & Co.
Remnants.
Feingold, H. & D.
Ribbons.
Cheney Bros.
Ring Travelers.
National Ring Traveler Co.
Shaw, Victor, Ring Traveler Co.
Roofing.
Standard Paint Co.
Rope and Twine Machinery.
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Roving Cans.
Hill, James, Mfg. Co.
Laminar Fibre Co.
N. E. Ventilating & Heating Co.
Walrus Fibre Mfg. Co.
Rubber Covered Rollers and Goods.
Boston Belting Co.
Rubberoid Roofing.
Standard Paint Co.
Saddles and Stirrups.
Dixon Lubricating Saddle Co.
Scales.
Sweet & Doyle.
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American School at the Armour Institute of Technology.
International Correspondence Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

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ALLINGTON OR MARSHALL

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James Bennett Forsyth, General Manager.

Secondhand Machinery.
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Manufacturers' Supplies Co.
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Singeing Machines.
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Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
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Smith, Drum & Co.
Textile Finishing Machinery Co.
Singe Plates.
Taunton, New Bedford Copper Co.
Sizing, Starch and Gums.
Arabol Mfg. Co.
Elwell, Henry A. & Co.
O. K. Soap Co.
Stein, Hirsch & Co
Skylights.
Drouve, G., Co.
Slashers.
Lowell Machine Shop.
Smokestacks.
Allen, Wm. & Sons Co.
Soaps.
American Soap & Washoline Co.
Elwell, Henry A. & Co.
India Alkali Works.
O. K. Soap Co.
Rome Soap Mfg. Co.
Spindles.
Bamford & Smith.
Buckley, Benjamin, Sons, Gun Mill.
Draper Company.
Easton-Burnham Co.
Stoddard, Haserick, Richards & Co.
Ward & Vandegrift.
Whitin Machine Works.
Spindle Tubes.
Bamford & Smith.
Stoddard, Haserick, Richards & Co.
Spinning Cylinders.
N. E. Ventilating & Heating Co.
Spinning Frames.
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Spinning Rings.
Draper Company.
Whitinsville Spinning Ring Co.
Spinning Tubes.
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Barber & Colman.
Spoolers.
Lindsay, Hyde & Co.
Payne, George W. & Co.
Stamps for Hosiery.
Atlas Copper Stamp Works.
Wells, Wilfred.
Steam Boilers.
Allen, Wm. & Sons Co.
Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co.
Steam Boxes.
Allen, Wm. & Sons Co.
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Allis-Chalmers Co.
American Blower Co.
Atlas Engine Works.
Buffalo Forge Co
Fishkill Landing Machine Co.
Harrisburg Foundry & Machine Co.
Hooven (The), Owens & Rentschler Co.
Sturtevant, B. F. & Co.
Textile Finishing Machinery Co.
Steam Jacket Kettles.
Badger, F. B. & Sons Co.
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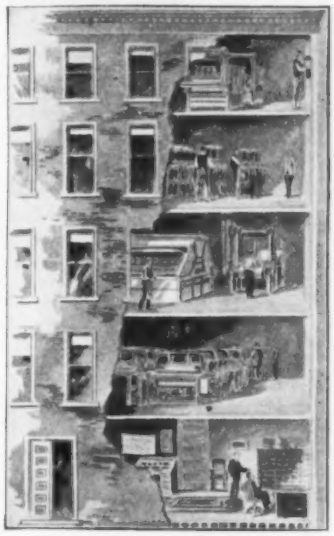

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Imhauser, E. & Co.
Nanz & Co.
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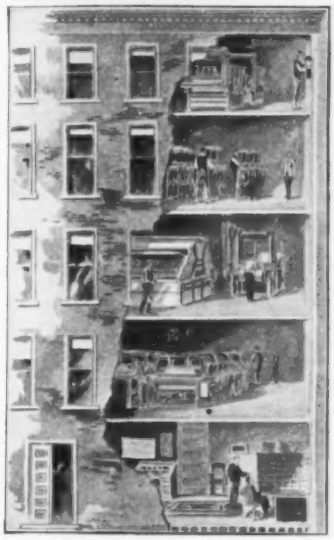

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Sargent's, C. G., Sons.

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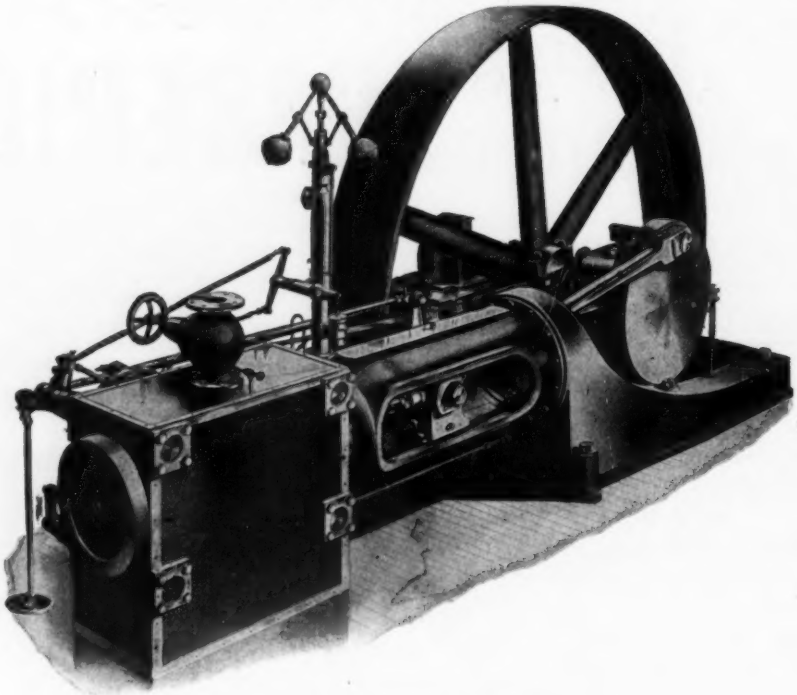

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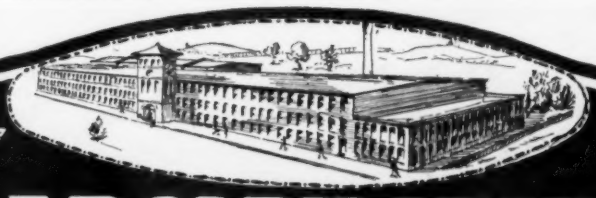

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Situated in the best wool producing district in the State. Large Stone Factory Building. Equipped with all necessary modern machinery, for the manufacture of Blankets, Cloths and Yarns. Steam and Water Power. Have been in operation a little over a year. Have established trade, and orders on our books now for over 3000 pairs of blankets for Fall delivery. Company is capitalized for $50,000, $17,000 worth of stock sold. We wish to interest parties with capital to invest. Would prefer those who have experience in the woolen goods trade, and would be willing to take an active part in the management of the business. **Address Sweet Grass Woolen Mills, Big Timber, Montana.**

KNITTING MACHINERY FOR SALE

One 3 in., two 3 1-4 in., two 3 1-2 in., one 3 3-4 in., one 4 in. Scott & Williams 7-8 Knitters, four cylinders for each machine. One set 110 needles for 4 in., fall 6 needles each size. One set 128 needles for 4 in., fall 8 needles each size. At your own price, make an offer. Used 2 years, in good condition. Apply WAYNE KNITTING MILLS, Ft. Wayne, Ind.

Embroidery Machines Wanted.

BONNAZ (CORNELY) EMBROIDERY MACHINES,

New or second-hand. State number of machines for sale and price. Address "X. Y." care Textile World Record, Boston.

FOR SALE OR LEASE

A Knitting Mill in a good location, fully equipped for manufacturing men's or ladies' ribbed underwear. 14 Nye & Tredick Knitting Frames, 24 Union Special Sewing Machines. Address "RIB," care Textile World Record.

PRINTING MACHINERY FOR SALE

1 Rice, Barton & Fales Three Color, 44 in. Printing Machine, complete in every detail, with blanket take-up, back grey frame and batcher, sprocket chain and gear.

1 Four Cylinder Granger Back Dryer, 60 in. dia. x 44 in. face, brass rolls, dry steam pipe system, expansion pulley, etc.

1 Schofield Foot Power Sewing Machine.

The above are practically brand new, never having had a full day's run over them.

1 Rice, Barton & Fales 60 in. Single Color Printing Machine.

1 Rusden Ageing Box, 50 in. x 18 ft., in first-class condition.

1 3 Bowl Padder, one 44 in. brass and two rubber rolls.

The Reliance Textile & Dye Works, Covington, Ky.

For Sale or To Let

Fine Mill Property, containing about 14,000 feet of well-lighted floor space, 60 h.p. engine, with full steam plant and electric equipment. Private reservoir and city water supply.

Situated in the city of Norwich, Ct. Offering a rare opportunity for persons desiring to start an industry. Address

R. W. PERKINS,

Thames Loan & Trust Co., Norwich, Conn.

E. R. SEABURY COMPANY,

COTTON GOODS,

New York Life Building,

346 BROADWAY

Accounts Solicited. *NEW YORK.*

EDWARD JEFFERSON & BRO.,

Worsted Machinery

127 South 2d St., PHILADELPHIA, PA.

SOLE AGENTS FOR

J. B. FARRAR & SONS, Halifax, England.

Briggella Cork Rollers for Spinning and Drawing.

TEXTILE MACHINERY

Large lot of Cotton, Woolen and Worsted Machinery of all kinds for sale. Best Prices paid for first-class second-hand machinery.

J. K. Lamb Textile Mach. Co.

246 Chestnut St.,

Long Distance Telephone. PHILADELPHIA, PA.

Knitting Machinery For Sale.

One (1) 24-Spindle Payne Winder, latest pattern, one hundred and eighty winder bobbins (180 .
Four (4) Excelsior Automatic Knitting Machines, 8¾-in. diameter, 160 needles, 42 gauge.
Four (4) Extra Cylinders, 160 needles, 42 gauge.
Four (4) Extra Cylinders, 128 needles, 30 gauge.
One (1) Extra Cylinder, 84 needles, 12 gauge.
One (1) 16-inch Looper, 9 points to inch.
One (1) 24-in. Looper, 14 points to inch.
One (1) Abel Footer, 9 needles to inch, 12 gauge.
One (1) Cyclone Stocking Dryer.
Four (4) Huse Single Feed Rib Machines, 4¼-in. diameter, with welt and slack course.
Six (6) Extra Cylinders for same.

Shafting, pulleys, tables, etc., all in first-class condition, nearly new. Will be sold as a whole or separate. Cheap for cash or on time. Apply to

W. H. MURPHY, 26 Chauncey St., Boston, Mass.

New and Second-Hand

COTTON OR WOOLEN MACHINERY

of Every Description may be had at Low Prices from

GEO. L. SCHOFIELD, 123 No. Front Street, PHILADELPHIA, Pa.

Send for List and state what you want.

AGENT FOR THE WESTON HYDRO EXTRACTOR.

The Manufacturers' Exchange

277 Broadway, New York

Industrial Agents for Cities, Towns and Boards of Trade.

Correspondence invited with Manufacturers contemplating removal or extension of their plants. Send for circular.

WANTED.

Control of Southern cotton mill. Reply, stating location, buildings, complete machinery inventory, when constructed, name of designer, etc.

WILLIS, HOMER, FRANCE & SMITH,
Post Office Box 10, Baltimore, Md.

FOR SALE

Woolen Factory, all complete and in good condition. Only factory in Cambria Co. Address LARIMER & DAVIS, Ebensburg, Pennsylvania.

FINISHING MACHINES Shears for Cloth, Carpets, Rugs, Plush with sets of Shears for one or both sides; Lapping, Folding, Rolling, Measuring Machine. The two and three-roll machines make solid roll holding length and finish. Baling and finishing Presses. HOWARD FOUNDRY & MACHINE WORKS, LANSDOWNE, Delaware County, Pa.

CYPRESS WATER TANKS

Best in the World. Send for Catalogue.
Write for delivered prices. **H. F. LEWIS & CO., Ltd.**
316 Baronne St., New Orleans, La.

MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable men who are entered on our list, and can usually supply their wants in this way.

Foreman Wanted, for Press and Packing Departments of knitting mill. Must be thoroughly reliable and competent, also strictly temperate. Address Virginia, Textile World Record, Boston.

Superintendent Wanted for Southern mill making women's cotton knit underwear, capacity 150 dozen a day. McMichael & Wildman machines. Give references and salary expected. Address Rib, Textile World Record, Boston.

Superintendent—Experienced man wanted to superintend and take financial interest in small hosiery plant in Ohio. Must furnish first-class references as to ability and character. State wages expected. Ohio, Textile World Record, Boston.

Wanted: a practical business man to buy one-fourth or more interest and take part management in a good paying knitting mill in the Northwest. Capitalized at $25,000. Address Superior, Textile World Record, Boston.

Foreman Wanted, who thoroughly understands making gloves and mittens on Lamb machines and Nye & Tredick ribbers, and who can produce a full sample line. Central Knitting Company, Cleveland, Ohio.

Looper Wanted: expert on looping and transfer work, a bright, intelligent girl wanted. Wm. C. Coleman, Sabetha, Kansas.

Overseer Knitting Wanted in hosiery mill, one who is thoroughly competent to look after a knitting room and all its details. Must understand National and Victor machines. Address Rock, Textile World Record, Boston.

Hosiery Finisher wanted to take charge of finishing department of mill in Middle West. Seamless, Textile World Record, Boston.

Knitter Wanted: to take position as second hand on Nye & Tredick machines. State experience and salary expected. Address High Grade, Textile World Record, Boston.

Wanted—Sewing Machine Fixer and Foreman of finishing for women's cotton underwear. Give experience, references and salary expected. Address Chickamauga Knitting Mills, Chattanooga, Tenn.

Cotton Dyer Desires Position. Has had long experience on short skein, long and short chain and raw stock dyeing. Good references. Address Cotton, Textile World Record, Boston.

KNITTER WANTED

An experienced knitter and fixer on spring needle machines. Must be capable of taking charge of room running from thirty to forty heads. State experience and wages expected. Address "C. R. C.," care Textile World Record, Boston.

KNITTING MILL MANAGER

A man of broad experience in the hosiery trade is open to assume the management of a hosiery mill where the business warrants a sufficient salary. He is not open for position in charge of a knitting room, but to assume the general management of the mill and business end of the business. Address 3028, care Textile World Record.

Forelady Wanted.

In Underwear Factory in a large western city. Must be experienced in handling help, and take full charge of Finishing Department. State experience and wages. Address "MEDINAH," care Textile World Record, Boston.

WANTED

A Practical Manufacturer of Gloves, Mittens, Toques, Shawls, etc., to invest in an established knitting plant. Address P. O. BOX 964, Milwaukee, Wisconsin.

BOSS DYER.

A first-class man wanted to take charge of thirty hands. Apply in writing, giving age, nationality, present employment and past experience.

Address "Web," care Textile World Record, Boston.

SITUATIONS WANTED.

An Expert in the manufacture of Lap Robes, Quilts, Couch and Table Covers, etc., would like to hear from manufacturers who desire to start in this business. The firm he was last with increased their robe business 100 per cent. the first season his patterns and colorings were put on the market. Enormous profits. United States or Mexico. Address Robes, Textile World Record, Boston.

Foreman Latch Needle Knitter. Ten years' experience. Men's, women's and children's underwear, plaited straight and shaped. Worked on S. & W., McM. & W., N. & T., S. &. H. and S. & W. fleece machines. Thirty years old, American, married. Best references. Address Foreman, Textile World Record, Boston.

Foreman Latch Needle Knitter. Age 29, married. Men's, women's and children's underwear. Understands Scott & Williams, McMichael & Wildman, Stafford & Holt, Snyder & Fisher, Nye & Tredick, Fisher Fleece, and the fixing of sewing machines. Salary moderate with prospects of advance. Will not go west of Buffalo. Best of recommendations. J. H. Entwistle, New Hartford, N. Y.

Bleacher and Dyer.

Situation wanted by an experienced Bleacher and Dyer of cotton, mercerized, wool and mixed goods; in skein, piece, or knit goods. Address, "Dyer," care Textile World Record, Boston.

KNITTING MACHINE SALESMAN

Wanted by a well established Knitting Machine Co. Must be a man with some knowledge of machinery and either experience in selling machines or the necessary qualifications to make a salesman. Address "SALESMAN," care Textile World Record, Boston.

SITUATIONS WANTED.

COTTON SUPERINTENDENTS.

Superintendent of cotton mill, a thoroughly capable man, is open to a position. Well up on English and American makes of machinery. Has manufactured yarns both in American and Egyptian cottons, from 17's to 70's. About 40 years of age; Scotch. Has held a responsible position in a New England company for the past 10 years. 1532, Textile World Record.

Superintendent Cotton Mill open to a position. Age 33; American; married. Good experience as overseer of carding in large mills. Combed and carded hosiery yarns, shirtings, sheetings, cheviots, madras. First-class references. 2096, Textile World Record.

Superintendent. Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 2095, Textile World Record.

Superintendent and Designer. Has had 18 years' experience in weaving room, 12 years being in charge of rooms in some of the best mills in New England on fine yarns and fancies and designing. Qualified for superintendent's place. 2098, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Superintendent Cotton Mill, or would take an overseer's position in large mill North for the present. Has been assistant superintendent for past year, previous to which he was overseer of carding for nine years, and before that was overseer of carding and spinning in the South. First-class references. Can take position at once. Colored and white goods. English and American machinery. 1853, Textile World Record.

FIXER WANTED

An experienced sewing machine fixer. Address WAYNE KNITTING MILLS, Ft. Wayne, Ind.

FOR SALE

The Largest Roller-Covering Establishment in the South, located in Charlotte, N. C. Operates two sets of machinery. Boiler and Engine. Now paying profit of $200 to $300 per month, and business can be largely increased. Premises centrally located. Lease at very low rent. Owner wishes to retire from business. Address ROLLER COVERER, 200 S. College St., Charlotte, N. C.

Who Has An Interest For A New Industry?

An expert in the LINEN INDUSTRY, German, age 38, will establish a Linen Mill for the manufacture of Towels, Table-Linens, etc., in the United States, and wants to interest a capitalist. Address "GERMAN," care Textile World Record, Boston.

WOOLEN SUPERINTENDENTS.

Superintendent of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1982, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Superintendent, woolen or worsted. Been overseer of weaving and superintendent in New England mills. Age 44, married; American. 1785, Textile World Record.

Woolen Mill Manager, formerly of Yorkshire, is open to take a similar position in the United States or Canada. 1976, Textile World Record.

Agent, or superintendent, or superintendent and designer. Good manager of help and a hustler. Thoroughly understands manufacture of shoddy in all its branches, including carbonizing and extracting. Familiar with all manipulations of wool, shoddy and cotton. Fully competent to take agent's position, as is a good wool buyer, and can figure all prices on goods and percentages, etc. 2053, Textile World Record.

Manager or Superintendent of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references. 1890, Textile World Record.

Assistant Superintendent or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots, kerseys, meltons and fancy cassimeres. Technical education acquired at Philadelphia Textile School. Six years' practical experience, three as designer. Age 24; American; good references. Will go anywhere. 1974, Textile World Record.

Superintendent or Designer, an American, married, 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage. 1936, Textile World Record.

PARTNER WANTED.

Practical man to invest some capital and share responsibility in running a two set Woolen and Knitting Mill in Middle states. Capital stock $25,000, paid in. Present manager owns 3-4 of stock and wishes practical man to take balance.

Mill situated in good wool growing district with large local and jobbing trade. Have orders on hand to run mill balance of year and could get more if had a partner to assist in running mill.

Mill building is brick, three stories, 50 x 80 ft.; boiler room separate brick building; picker room also separate with blower to send wool direct to card room. Mill contains two sets cards, warping, spooling and twisting machinery, mules, nine looms, shears, steam press, wire and tensel gigs; eleven knitting machines, ribbers and loopers and all fixtures complete for knitting.

A rare chance for a practical man with some capital.

Address "CAPITAL," care Textile World Record, Boston.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding. Age 39; married. Worked on coarse and fine numbers and combers. American and English machinery. 3012, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Boss Carder. Aged 28. Worked on plain goods. Will go South or anywhere. Steady man, and excellent references. Also a frame spinner. 1759, Textile World Record.

Boss Carder or Ring Spinner and Combing. Cotton hosiery yarns. Will go anywhere. Excellent recommendation. 3025, Textile World Record.

Overseer or Second Hand of Cotton Carding. Age 33; German; married. Hosiery yarns, sheetings, prints, all grades of cotton from waste to Egyptian cotton from 80 to 1600 hank. Not at present employed. Good experience and references. 3026, Textile World Record.

WOOLEN CARDERS.

Overseer of Woolen Carding, age 32; American; married. Good experience and excellent references. Worked in kerseys, meltons, cheviots, cassimeres, coverts, dress goods, broadcloths, etc. 2060, Textile World Record.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2083, Textile World Record.

Overseer Burling and sewing, or cloth examiner in commission house. Familiar with cassimeres, chinchillas, dress goods, serges, cotton worsteds and all worsted goods. 1866, Textile World Record.

Overseer of Carding and Spinning. Middle aged; English; married. Dress goods, flannels, blankets, overcoatings and plush goods. English and American makes of machinery, also an expert on the Bollette condenser. 2079, Textile World Record.

Boss Carder. Cotton, woolen, worsted and silk mixes of all kinds. Can take place at once, and wants not less than $3 per day. Age 48; American; married. Excellent references and experience. 2055, Textile World Record.

Overseer of Woolen Carding. Age 26; American. Familiar with all American cards. Worked on cotton, wool, shoddy, noils and mixes. Strictly temperate. Will not go West or South. Refers to past employers. 3023, Textile World Record.

Secondhand Carder familiar with all wool, wool and cotton and shoddy mixes on Davis & Furber and Furbush cards would like to obtain a position. 21 years old, American. Good references. 2000, Textile World Record.

COTTON WEAVERS.

Woolen Boss Weaver. Steady, reliable and an excellent man in a weave room. Has worked on almost all kinds of woolen goods, and is familiar with Crompton & Knowles looms. Will accept position for not less than $2.50 per day. 2088, Textile World Record.

Boss Weaver or Designer, or could fill a position as all around man in a small mill. Age 42; Scotch; married. Worked on fancy cashmeres, blankets, flannels, carriage robes, and other fancy goods. Is familiar with Crompton & Knowles, Davis & Furber, and other looms. Wants to go West or South. 1940, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Boss Weaver or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference. 2019, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

WOOLEN WEAVERS.

Overseer of Cotton Weaving. Sheetings, sateens and all kinds of fancies from 2 to 24 harness, lenos, lappets and jacquard. Age 32; English and married. 1934, Textile World Record.

Overseer of Cotton Weaving. Age 34; American; married. Fine lawns, sateens, corduroys, crochet goods and all kinds of fancies and lenos. Can take position at once. 2087, Textile World Record.

Boss Weaver, who is familiar with cotton, woolen and worsted looms and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills. 1959, Textile World Record.

Overseer of Weaving in cotton mill. Worked on lawns, dimities, sheetings, corduroys, velveteens, etc. Colvin, Mason, Whitin, Kilburn & Lincoln, Knowles and Draper looms. 3011, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references. Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Cotton Mule Spinner. Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with. 1690, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

Second Hand on Mules. Has had 20 years' experience on cotton mule spinning as mule fixer and second hand. Age 39, with family. Good references. 1950, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer Ring Spinning, Warping and Spooling. Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married. 1703. Textile World Record.

WOOLEN SPINNERS.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

Overseer Woolen Spinning. Is thoroughly competent to take charge of a large spinning room. 38 years old; French; married. Has spun yarns for flannels, tweeds and knit goods, also cotton and wool mixes, shoddies, ranging in all from 1/2 to 14 runs. Is familiar with Davis & Furber, Johnson & Bassett, Platt and other makes. Very satisfactory references. 1917, Textile World Record.

Worsted Spinner or Section Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay. 1709, Textile World Record.

Worsted Drawer and Spinner. Would take twisting. Age 28; English; single. Can furnish references as to ability and character. 1784, Textile World Record.

Overseer of Ring or Frame Spinning, or would take superintendent position. Age 41; married. 2040, Textile World Record.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

DYERS.

Dyer. Second-hand in large house, or boss dyer in small reliable woolen mill. Would accept good offer as chemist to some mill. Age 25; American. Textile graduate, and has held various positions in the laboratory and with dyestuff dealers during past three years. 2097, Textile World Record.

Dyer, Scourer and Bleacher in knitting mill Age 39; married. All grades of underwear spring and latch needles. First-class recommendations. Will not go West or to Canada. 3004 Textile World Record.

Dyer on cotton and woolen piece goods, yarn and fast black on cotton. Age 42; married. 3021, Textile World Record.

Overseer of Dyeing and Bleaching. Age 38; Scotch, married. Denims, awnings, ticking, outing flannel and madras. First-class references. 3022, Textile World Record.

Boss Dyer and Bleacher. Age 34; English; married. Yarns, warps, knit goods. Can give good references. Wants $4 or more. 3020, Textile World Record.

Expert Hosiery Dyer. Age 27; married and sober. Desires position of superintendent of dyeing in a first-class hosiery mill, one manufacturing high grade goods preferred. Has had over seven years' practical experience in dyeing one of the best aniline blacks on cotton, also fast colors on cotton, wool, silk and union hosiery. Best of references furnished. 2052, Textile World Record.

Boss Dyer. Has a practical knowledge of the combination of colors and shades and has matched to shade. Steady, sober and industrious. Underwear, piece dyes and raw stock, mercerized goods, wool and cotton. 1513, Textile World Record.

FINISHERS.

Finisher of Cotton Goods, also worsteds, by calender, hot press and beetle, also understands frames, starching and mercerizing. Age 25; English. 3006, Textile World Record.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Cotton Finisher. Age 27. Worked on prints, lawns, dimities, muslins, ducks, drills, Madras, etc. Understands folding and packing. 3005, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Overseer of Finishing. Prefers a satinet mill Eight years' experience as overseer. Aged 47 3017, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Boss Finisher. Would take good secondhand or wet finishing job. Age 41; English. All kinds of woolen and worsted goods, both steam and dry finish. Willing to go anywhere. Both English and American makes of machinery. Excellent references. 2061, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

KNITTERS.

Foreman Latch Needle knitter, or fixer with good chance of promotion. Men's and women's underwear, cotton, worsted and silk. Worked on Scott & Williams, McMichael & Wildman, Stafford & Holt, Snyder & Fisher and the Fisher fleece machines. Recommendations. 3000, Textile World Record.

Superintendent or Manager of hosiery mill. American. Has had 30 years' experience. Can give best of references for character and ability. Present employers retiring from business. Salary moderate, with prospect of advance. 2047, Textile World Record.

Manager or assistant superintendent, lace making or seamless hosiery. Would like to invest in Southern mill. A young man; English; married. 2066, Textile World Record.

Machinist on Leighton circular machines. Worked on sweaters and jacket. 2026, Textile World Record.

Superintendent knitting mill. Cotton and wool hosiery, heavy mittens, sweaters, toques. Good experience. Aged 45; married. 1291, Textile World Record.

Overseer of Knitting. Ladies' and infants' underwear. Good experience. 1777, Textile World Record.

Boss Knitter or second hand. Silk, worsted, lisle, cotton and mixed yarns. Is familiar with any latch needle machine. 1819, Textile World Record.

Overseer of Carding and Spinning. Worked on dress goods, flannels, blankets, overcoatings, plush goods. Good and long experience. Wants position at once. Steady man. 2079, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record

Overseer on Spring Needle circular knitting machines wants position. An ingenious, energetic and progressive man, who has spent his life in one of the largest and best equipped knitting mills in country. Particularly good on fine jerseys, stockinets, fleeces, eiderdowns, rubber linings, dress shields, blankets, slipper cloth, etc. 2094, Textile World Record.

Foreman of Knitting Room, spring needle or flat knitting. Age 28. Fleeces of all kinds and gauges, balbriggan from 20 to 30 gauge, flat wool work all gauges. Is familiar with Tompkins Bros., Campbell & Clute and Crane machines. 2062, Textile World Record.

Cuff Knitter and Fixer. Wants a place where he will have steady work. 1951, Textile World Record.

Fixer or Foreman. 27 years old, 11 years in the manufacturing and finishing department. Familiar with Excelsior, Scott & Williams, Brinton and Branson automatic, and Scott & Williams and McMichael & Wildman ribbers and Hepworth loopers, besides having a general knowledge of other hosiery machinery. Can give best of references as to steadiness, ability, character. 3024, Textile World Record.

Superintendent. All grades and weights of hosiery and ladies' ribbed underwear. Is familiar with Standard, Boss, Nye & Tredick and Branson machines. 598, Textile World Record.

MISCELLANEOUS.

Loom Fixer. Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Spare Hand Loom Fixer. Wants place where he can settle down. Is familiar with Crompton & Knowles looms. Age 40. 2091, Textile World Record.

Foreman of Repair Shop. Age 30; American; married. Several years' experience in cotton mill repair work. Is familiar with almost any kind of machinery as far as repairs go,—Lowell Machine Shop, Hetherington, Kitson, Providence, Biddeford, etc. 2023, Textile World Record.

Colorist and color mixer for all kinds of printing. Also understands plush printing and extract work. 10 years' experience. Can give references. 2045, Textile World Record.

Master Mechanic wishes position in the North. 35 years old; married. Worked 15 years on repairs. Wants $3.50 per day. Has license for running engines and boilers Understands all kinds of water wheels and care of same, dynamos and electric lights and also gas houses, and a good knowledge of building, all kinds of wood work and piping and blacksmithing. Understands cotton mill repairs as good as the best man at such work. 2025, Textile World Record.

An Expert on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old; English; married. Has worked for one concern in the United States for 12 years. 1980, Textile World Record.

DESIGNERS.

Designer in small mill or assistant in large mill. Age 22; Scotch; single. Has worked on fancy cassimeres, plaid backs, coverts, unions, worsted trouserings and shirtings. Fair knowledge of Jacquard designing. Johnson & Bassett mules, Davis & Furber dresser, and Knowles looms. Is willing to work for moderate salary, with chance of promotion. 1837, Textile World Record.

Smart Designer, high class worsteds and coatings and trouserings. Thorough experience leading factory. Now abroad; anxious to find employment in this country. Moderate start. 1816, Textile World Record.

Assistant Designer on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references. 1923, Textile World Record.

Designer or Assistant Superintendent desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable. 1998, Textile World Record.

A Young Man, 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family. 1997, Textile World Record.

Designer, or assistant designer. Unions, flannels, tweeds, beavers, serges and worsteds. Age 28; English; married. Can furnish first-class references. 3031, Textile World Record.

Perfect Fast Black for Hosiery

The "Dubois' Sanitary" Oxidized Fast Black Dyeing Process with the Lisle Thread Silk Finish, Patented March 17, 1903, and The "Dubois Sanitary" One Dip Fast Black in Powder Form, Leads Them All!

This is the most reliable dyeing formula known to fast black dyers. It has been adopted successfully by many leading mills. It always gives uniform shade, oxidizes well and the fabric is almost as strong as though dyed with direct colors. Most important of all, it gives a fine lisle thread finish without in the least tendering the goods. Beware of cheap fast black formulas, which are sure to be dearer in the end.

The cost of the Dubois black, the best in the market, is very reasonable, as low as $1.40 per 100 pounds dyed in ordinary black for cheap trade, and not over $2.50 per 100 for the very best black for high grade goods, guaranteed to be ungreenable to acid tests and wear. Manufacturers of knit goods, hosiery and job dyers ***take notice*** that I am prepared to give licenses with full instructions for producing lisle thread finish (processes patented March, 1903) on any kind of direct colors or fast black, either before or after dyeing or bleaching.

Sulphur and diamine blacks particularly are so much improved after having been lisled by my patented process that they look just as well as aniline oxidized fast black, and yarn costing 17 1-2 cents per pound will produce as fine a looking fabric treated by my process as the genuine lisle thread at a cost of 34 cents per pound. This is a boon for direct color job dyers and bleachers, as well as for manufacturers of hosiery and knit goods.

The license will be given on a small royalty per 100 pounds.

All the machines used for the fast black and lisle thread finish, also for giving lisle thread finish to direct colors on bleached or unbleached goods are of my own invention, and are

PATENTED AS FOLLOWS:

June 18, 1901. Rotary oxidizing apparatus. The only machine in the world that carries the goods while oxidizing and lisling at all points of the compass. Quickest oxidizer known.

September 8, 1902. Rotary yarn oxidizing apparatus. Also carries the yarn at all points of the compass while in process of oxidizing or steaming.

June 10, 1902. A stationary hosiery oxidizing apparatus. Two different speeds. Especially constructed for lisle thread finish on hosiery or knit goods, equipped with an electric thermometer for the accurate measurement of the dry and wet hot air.

December 10, 1900. Stationary hosiery oxidizing apparatus. Two speeds. Chain and sprocket wheel drive with double clutch to start and stop. Very strong for heavy work, also built for lisle thread finish.

ALSO NOTICE:- That My One Dip Sanitary Fast Black in Powder Form is the same black as the Sanitary Oxidize Fast Black Process mentioned at the head of this advertisement, and is a long felt want among the trade, particularly for small concerns whose production would not warrant the equipping of an Oxdize Fast Black Dyeing plant.

This One Dip Sanitary Fast Black is dyed in the open ordinary dye tub at boiling heat in one hour, then washed and softened, if desired, as is done with all other direct colors for cotton hosiery, and has the advantage on the other direct blacks to allow the production of any shade desired from a jet to a very blue black, and matching well the oxidized aniline black.

The cost per 100 pounds hosiery dyed with this black is from $3.50 to $3.80 according to amount of softener used.

This One Dip Sanitary Black is positively guaranteed to be ungreenable to acid test and wear and leave the fabrics as strong after dyeing as it was in the white.

The apparatus required to start dyeing are but two ordinary wood dyer's tubs and one hydro-extractor.

Those wishing to put on their goods so dyed my "Lisle Thread Finish" (Patented) can do so by simply adding to above apparatus one or more of my "Stationary Oxidizing Machines" (Patented June 10, 1902), and take out a license for the use of my patent for lisle thread finish on vegetable fabrics, which will be given free of charge, and all you will have to pay for the use of the machine and the lisle thread finish process, will be but a small royalty for each 100 pounds hosiery given the lisle thread finish.

Dyers and manufacturers that are far away may procure a license with full instructions for building the machines economically, paying a small royalty for the use. I have made the royalties low, so that ***no one may be debarred by reason of the price,*** but I mean to protect my patents and will vigorously prosecute any who infringe.

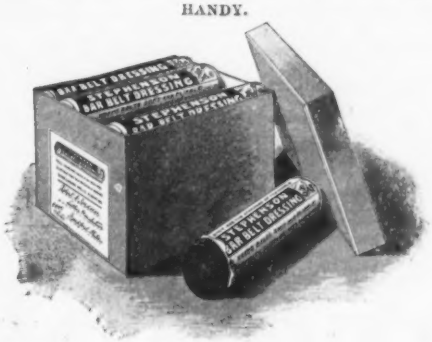
Fast black dye and bleach plants for hosiery, underwear and skein fast black yarn dyeing, installed and equipped complete, if desired. Apply o

A. N. DUBOIS, 2170 Sedgeley Ave., Phila., Pa.

or

KEYSTONE LAW and PATENT CO., Betz Bldg., So. Broad and Market Sts., Phila., Pa.

HANDY.



NON-SPILLABLE.

THE subject of BELT DRESSING is not too trivial for the Buyer who wishes to run his mill to its full capacity for the least expense.

Time of idle hands is money.

Spoiled product is money lost.

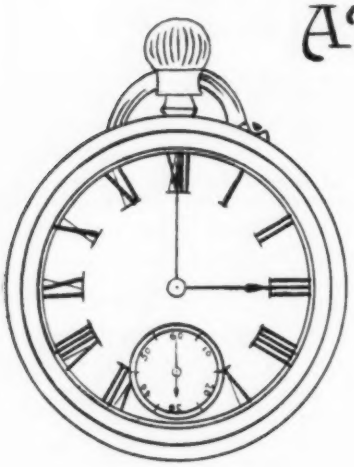
In buying Stephenson Belt Dressing you are insured against further shut-downs to take up slack belts.

Its many good qualities can only be appreciated by its use.

May we have your next **trial** order, or shall we send you you a free sample by mail?

STEPHENSON MFG. CO., - Albany, N. Y.

Deliveries always on Time



ATLAS COPPER STAMP WORKS

15 WHITEHALL ST. N.Y. CITY.

Quality abreast of the Times

Artists trained to the Minute for Chop Designs

Tel. 4524 Broad

1903 Directory Now in Preparation

¶In reply to many inquires about the date of publication of the **Annual Official Directory of Textile Industries in the United States and Canada**, the publishers wish to state that owing to the great amount of work incident to the consolidation of Textile World and Textile Record, our facilities were taxed to the utmost and the Directory has been slightly delayed. Instead of being published in May as expected it will not be issued until late in June. *Orders received now will be promptly filled on publication.*

PRICE:	Traveler's Edition, ...	$2.00
	Office Edition	2.50
	Or in combination with Textile World Record (per year)	3.00

LORD & NAGLE COMPANY

95 SOUTH STREET : : BOSTON, MASS

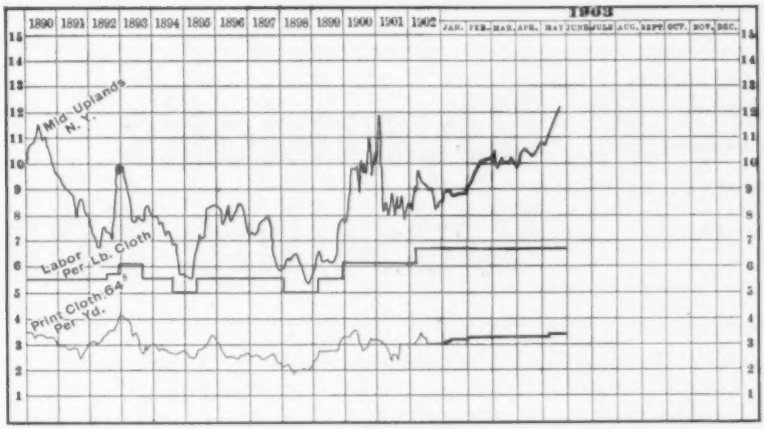


CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Spot cotton has sold at 12 1/8 cents for middling uplands during the past month, a price 1/8 cent above the quotation of February, 1901, and higher than any recorded on our chart which covers the past thirteen years.

A marked difference between the present conditions and those of February, 1901, lies in the fact that the 1901 quotation of 12 cents was at New York only and due to a New York corner. At that time cotton was selling around 10 cents in all other markets and the Fall River manufacturers made large shipments to New York to be sold during the pinch of the shorts, knowing that the flurry was temporary and the result of artificial conditions brought about by men who buy what they never expect to receive, and sell what they do not own.

Today the advance has affected every cotton market throughout the world, and is based to a considerable extent on an actual shortage of cotton. That there is not enough to go around is the general belief, in support of which they point to the many mills in England and on the continent that have been run on short time during the past two years on account of the inability to buy such cotton as they wanted.

A feature of the situation has been the relatively strong demand for spot cotton by foreign spinners at the high prices of last month. No matter to what extent the European spinner may desire cheap cotton, the conviction has been forced upon him during the past few years that he will soon be face to face with a more or less serious cotton famine. This sentiment has stimulated the cotton growing enterprises in British, German and French colonies, enterprises which appear to be nothing more or less than forlorn hopes.

The domestic cotton goods market has strengthened quickly in sympathy with the price of the raw material. In another part of this issue attention is called to the superior purchasing power of the American people. Here is found the chief cause for anxiety on the part of the foreigner. We are far better able to use 12 cent cotton than are the inhabitants of foreign countries. The foreign market is thus placed at a great disadvantage. They must buy our cotton and thus increase our home consumption of the staple, diminish their supply and increase the market price.

The world's visible supply of cotton on May 25th is estimated by the Chronicle at 2,827,552 bales, as compared with 3,177,170 bales on same date in 1902, 3,336,132 bales in 1901, and 2,435,552 bales in 1900.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

Crochet Lace Edgings
Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :
Write for Prices and Samples. George W. Chapin 229-231 Church St. PHILADELPHIA

Think it over! Wyandotte Washing Soda

SHERMAN CARPET MILLS,
Henry Holmes & Sons, Inc.

Trenton Ave., Phila., Pa.

The J. B. Ford Co., Wyandotte, Mich.

Dear Sirs:

We have used several thousand pounds of your "WYANDOTTE WASHING SODA" in connection with Soda Ash and soap to scour carpet yarns, with excellent results.

The yarn is much cleaner and stronger than when scoured with Soda Ash and soap alone and the work is done at less expense.

Very truly yours,

HENRY HOLMES & SONS, Inc.

AMBER DYE WORKS,
Dyers of Cotton, Woolen and Worsted Yarns.

Amber St., Phila., Pa.

The J. B. Ford Co.,

Dear Sirs:

We have been using your Wyandotte daily this last month, in conjunction with Soda Ash, and are pleased to say, we find the results very satisfactory.

Yours very truly,

THOMAS DAWSON & CO.

Our Offer

Order from one to five barrels from your supply house. Give it a thorough trial, if not all we claim for it, return the unused portion at our expense. A trial will cost you nothing.

The J. B. Ford Co.
Sole Manufacturers,
WYANDOTTE, .. MICH.

None genuine except with this Trade Mark.

"Wyandotte"

MANUFACTURED BY
The J. B. Ford Company,
Wyandotte, Mich.

In Every Barrel.

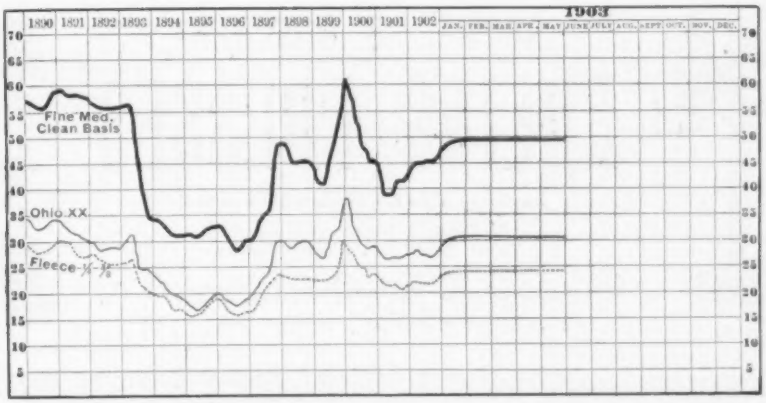


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

A strengthening of the wool market has been in evidence during the past few weeks. Manufacturers have shown an increased interest although as yet sales continue of moderate proportions. In the West there is a considerable part of the new clip still in the possession of the growers, who are holding on for an advance from the full rates paid for the wool already disposed of.

The new wool that has passed into the hands of eastern dealers was sold at prices above the seaboard markets. Very little old wool is now in stock, and as a consequence, manufacturers looking for bargains have been disappointed.

The manufacturers belittle the reported improvement on the goods market and assert positively that any advance in the cost of raw material means a loss for them. While there has been an unmistakable improvement in the woolen goods market, it has been in the line of duplicate orders at old prices, or new orders at no increase over last year's prices. Such conditions afford no substantial basis for an advance in wool. One reason for the belief that no such advance is likely to come, or, if it does come, to prove of long duration, is the prospect which amounts to a certainty that wool substitutes will take the place of wool when the price of the latter rises above the level of 50 cents for fine medium territory.

A feature of the market has been the activity in coarse wools, both here and abroad. It is reported that the eastern markets have been practically cleared of certain coarse grades running to 1/4 and 3/8 blood.

The prospect at present is for a continuance of the present firmness in the wool market. The wool to be sold is now in strong hands where no pressure is likely to cause the owners to unload at a loss.

Kentucky, Franklin. The Franklin Woolen Mills contemplate installing additional machinery in the plant.

Connecticut, Ballouville. The Ballou Mill has recently installed 50 new looms in the plant.

Connecticut, Moosup. The American Woolen Company is removing the worsted machinery in the Glen Falls Mills and plant will be used entirely for weaving and finishing. The "lower mill," where weaving is now done, will be equipped for manufacturing woolen yarn. They will increase number of cards, making the plant one of 25 sets.

THEODORE JUSTICE. HENRY JUSTICE.

JUSTICE, BATEMAN & CO.

Wool Commission Merchants,

122 South Front St., PHILADELPHIA.

Standard Quality Combed Ramie Top and Noils a Specialty

SOLE AGENT

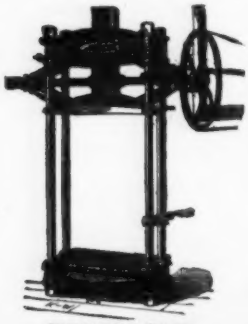
FRANK A. TIERNEY

Fine
Medium and
Coarse
Wool Tops.
Mohair Tops.
Camels Hair Tops
RamieYarns for all purposes
in all numbers.

Wools, Tops, Noils.

Fine
Medium and
Coarse
Wool Noils.
Camel Hair Noils.
Silk Noils.

Room 203, Wool Exchange Bldg.
260 West Broadway, New York



KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.

HYDRAULIC.

EASTON AND BURNHAM MACHINE CO.,

Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS
TO SPOOL FROM COP, SKEIN, OR BOBBIN.

WEIMAR BROS.

MANUFACTURERS OF
Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street, PHILADELPHIA, PA.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPIA.

For 25 YEARS We have held OUR REPUTATION as Progressive Manufacturers. Do not forget this when ordering GAGES.

ORIGINAL SINGLE BELL CHIME WHISTLE
Harmonious
Far Reaching
Pleasing.

A Truthful Gage is the only GOOD GAGE.

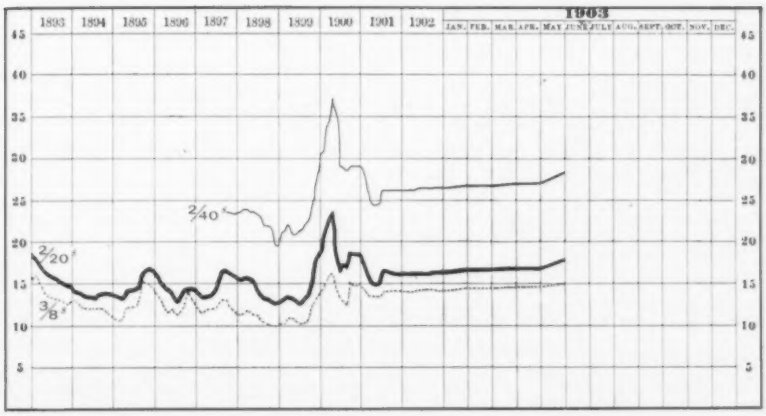
This Company manufactures, besides the above a large variety of articles used in connection with steam engines and boilers, all of which are standard quality, and may be relied upon. *Send for Catalogue.*

CROSBY STEAM GAGE & VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

The advance in the price of raw cotton has demoralized the market for yarn to such an extent that it is impossible to give anything besides nominal quotations. While the general situation affords good grounds for believing that an advance in raw cotton is warranted and is likely to place prices on a permanently higher level, there exists a fear that speculation is responsible for much of the recent advance and that prices will drop when the artificial support is withdrawn. Under present conditions, therefore, the spinner is at a loss to decide whether to curtail production, sell yarn at present prices or buy cotton and run his mills with the idea of getting an advanced price for his product.

The same uncertainties operate to check business on the part of the buyer of goods. Sales of yarns have been small, and represent actual requirements of knitters and spinners. The situation is too uncertain to warrant either buyer or seller basing contracts for the future upon it.

The continued prosperity of the country is a strong support to prices. The income of the people is large, their purchasing power good and they are thus able to buy liberally at an advance that would under ordinary circumstances put a stop to consumption.

The manufacturers of cloth and knitted fabrics have advanced prices sharply to balance the advance in the price of cotton and cotton yarn. We quote as follows:

Eastern Cops.

6's	17¾
8's	18
10's	18¼
14's	19¼
16's	19¾
22's	21½
24's	22½
26's	23¼
30's	25¼
34's	25¾
36's	26¼
40's	28¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	18½
14's	19
18's	22
20's	23
22's	23½
26's	24
28's	25
30's	26
36's	28
40's	30
45's	32
50's	35
55's	38
60's	45

Eastern Two-Ply Warps, Carded Peeler.

2/30's	26-27
2/36's	28-29
2/40's	30-32
2/45's	33
2/50's	36-37
2/60's	45-46

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	36
35's	37
40's	40
45's	43
50's	48
55's	52
60's	55
70's	62

Two and Three Ply Skeins, Combed.

30's	38-39
36's	40-41

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

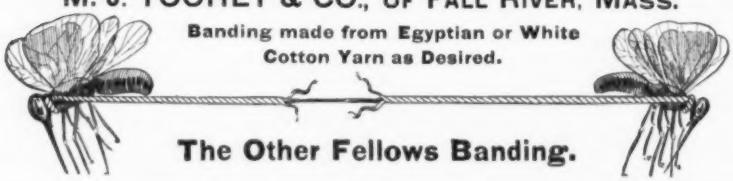
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

40's	42-43
45's	45-46
50's	50-51
55's	55-56
60's	59-60
70's	65-66

Philadelphia Yarn Market.

The yarn market at present is in a very unsettled and unsatisfactory condition. The recent wild speculation in cotton has put prices to a much higher level. In fact, spinners who are not covered on cotton are compelled to ask prices that it is impossible to obtain. Spinners do not know what to ask for yarn, and there is such a variation in the prices quoted that it is very hard to name a price that accurately represents the market value of yarn today. A great many spinners have withdrawn all quotations, and others have their idea of prices so high it is impossible to find buyers.

The entire textile industry is affected. A number of mills have already shut down, and others intend doing so as soon as their stock of low-priced yarn is exhausted. Manufacturers cannot obtain new orders at sufficient advance to cover the increased cost of yarn and supplies. In addition to this there is a probability of serious labor trouble in Philadelphia, and other manufacturing centres. Buyers are confining purchases to immediate needs, hoping there will be a reaction in the near future.

We quote as follows:

Southern frame cones (good quality):—

7's and coarser	17
8's and 9's	17¼-17½
10's	17½-18
12's	18-18½
14's	18½-19
16's	19-19½
18's	19½-20
20's	20-20½
22's	20½-21
24's	21½-22
26's	22-22½
30's	23-24
40's	28
50's	34-35

Southern high grade mule yarn:—

Cones.

10's	18½-19
12's	19-19½
14's	19½-20
16's	20-20½
18's	20½-21
20's and 22's	21-22
24's	22½-23

Southern frame yarn, lower grades:—

6's and 8's	16½
10's	17-17½

Eastern cones (high grade quality):—

10's	19½-20
12's	20-20½
14's	20½-21
16's	21-21¾
18's	21¾-22
20's and 22's	22¼-23½

BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 LEONARD STREET, ∴ NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL & CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Yarns.
67 CHAUNCY STREET, BOSTON.
216 CHURCH STREET, NEW YORK.
206 CHESTNUT STREET, PHILADELPHIA.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED ∴ YARN ∴ SPECIALTIES

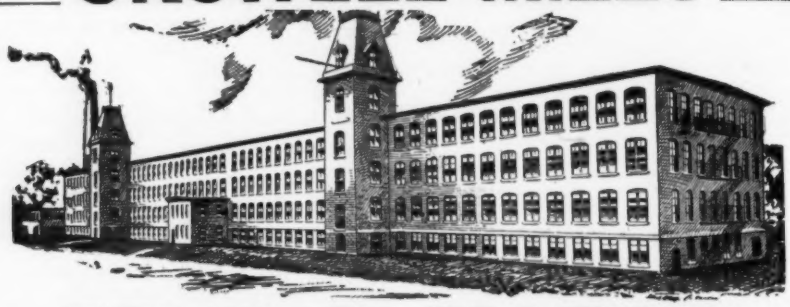
A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

FRED STERNBERG & CO.
Successors to EICHMANN & STERNBERG,
530 Broadway, - NEW YORK.
MERCERIZED / TURKEY RED / GASSED } COTTON YARNS.
JACQUARD and HARNESS TWINES.

J. S. DODDS,
346 Broadway, N. Y. Life Bldg., New York, N. Y.
MERCERIZED YARNS
Two and Three Ply, for all purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.



COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND

FITCHBURG, MASS. **WARPS**

LUZERNE COTTON YARN CO.,

MERCERIZED YARNS.

Mercerizers, Dyers, Bleachers and Coners,

WILKES-BARRE, PENNA.

American Cotton Yarn Exchange

COMBED and CARDED

COTTON YARNS

From Northern and Southern Mills.

American, Egyptian, Peruvian and Sea Islands.

ARNOLD B. SANFORD, Pres. and Gen. Mgr.

PERCY H. de MAURIAC, Vice President.

OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y. with James Talcott

TRADE MARK E-G YARNS CLOTH

ENGLISH-GREENE CO.

Commission Merchants,

Greene Bldg., 26 Fountain St., Prov., R.I.
53 Leonard St., New York.
300 Chestnut St., Phila.

Consignments Solicited for Southern Mills. Liberal Advances Made and Sales Cashed Promptly.

SAVOGRAN

Cleans Wool, Floors, Anything.

INDIA ALKALI WORKS, Boston.

Indian Orchard Company.

Cotton Warps and Yarns. In Gray and all Colors. Single or two or more Ply and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

Lower grades Eastern yarn:—

6's and 8's	16½
10's	17-17½

Rise ½c. per number to 16's.

Skein yarn (mostly Southern):—

4's to 8's soft	16-16½
10's to 12's	16½-17
14's to 20's	17½-18½
22's	19
14/2	17-17½
16/2	17½-18
20/2	19-19½
30/2	23
40/2	28
16/3 slack	17-17½
12/3 slack	16½-17
8/3 carpet	15-15½
8/3 slack	15¼-15¾
9/4 slack	15¼-15¾

Warps (mostly Southern):—

14's to 16's	17½-18½
20's to 22's	18½-19
26's	19½-20
14/2	17½-18
16/2	18-18½
20/2	19-19½
24/2	20½-21
30/2	23-24
40/2	27-28

Mixed colored yarns (mock twist, half colors):—

6's to 10's	18½-20
12's to 14's	20½-21½
16's to 18's	21½-22½

Silver and jaeger, 1½c. over white.
Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners of worsted yarn are all working hard for orders, but weavers are buying cautiously, the only orders being secured are for yarn not higher than 1/2 Blood quality, while the larger percentage is for yarn between 3/8 to 1/4 Blood. The prices quoted are very irregular. Said one spinner: "We do not expect to secure many orders at this time from the fact that we are certainly above what weavers are willing to pay. We are getting offers all the way from 5 to 10 cents per pound less than what we can make the yarn for, and as we will not make yarn for a loss we must stay out of the market until prices are adjusted to a business basis." Said another in writing to his salesmen: "We note you are figuring on some further orders, but wish you to note that since writing you last we have changed our ideas somewhat as to prices. We have been using domestic 1/4 to 3/8 Blood wool, but the country dealers have advanced the prices to a point where we find it necessary to advance prices on yarn as we cannot substitute foreign wools, as these wools are higher than domestic wools. If wool continues to advance at country points we think all yarns must necessarily advance also as spinners will not run their mills and make yarns at a loss."

RICHARD A. BLYTHE,
Commission Merchant,
COTTON YARNS OF EVERY DESCRIPTION.
114 Chestnut St., Philadelphia.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted, Cable Cords and Twines.
PAWTUCKET, . . R. I.

Walcott & Campbell Spinning Co.
Fancy Hosiery Yarns
IN ALL COLORS
New York Mills, Oneida Co., New York

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

POCASSET WORSTED COMPANY,

Worsted Yarns.

OFFICES:
6th Floor, Banigan Building,
PROVIDENCE, R. I.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

RICHARD CAMPION,

Selling Agent for
BRISTOL WORSTED MILLS,
HIGHLAND WORSTED MILLS.

Worsted Yarns

ALL QUALITIES AND NUMBERS.
17 Bank Street,
PHILADELPHIA, .. PA.

YARNS

Solis, Boston.
179
DEVONSHIRE STREET.
ANDREW J. SOLIS, Jr. & CO.

KEYSTONE SPINNING MILLS CO.,

Manufacturers of
Woolen Carpet and Rug Yarns,
Wool Scouring, Carbonizing, Garnetting,
1631 No. Second St. PHILADELPHIA, PA.

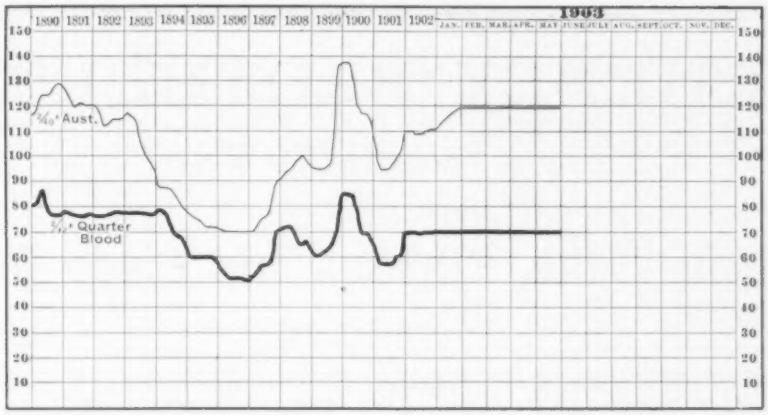


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

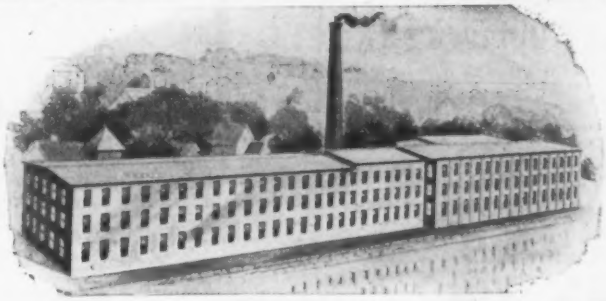
To this statement weavers say they do not care anything about yarn, that they have no orders—can get no orders and therefore have no use for yarn. One weaver stated that he had not been so dull since 1893. The spinners who are meeting weavers' ideas are the only ones who are booking orders. It is well weavers purchased cautiously, as those who did not, own yarn in some instances 5 to 8 cents above the market.

Then again some weavers placed orders last November and December with spinners and up to date have given no spinning instructions. Spinners do not expect to get any more money for manufacturing yarn, but do not want to lose money on the yarn because of high priced wool

Prices of yarns are very irregular; prices for certain grades of wool have been lowered and yarn is sold at a lower price, while on the other hand other grades of wool of slightly different character are firmly maintained and spinners in consequence can not lower prices. There has been but very little fine worsted yarn sold—the prices seem to be beyond the reach of buyers.

The worsted weaving mills generally have from one quarter to one half their looms idle at the present time. Whether there will be any improvement depends upon the duplicate orders. Certain weavers expect a much better business from these duplicates. This event will not develop before the middle of June if then, and weavers say even if

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.
MOHAIR TOPS AND YARNS FOR WEAVING
LUSTRE YARNS FOR SERGE LININGS
ALPACA YARNS

SPINNERS OF MOHAIR YARNS FOR ZIBELINES
DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS
MOHAIR

CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

SALESROOMS:

477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut Street, PHILADELPHIA.
79 Chauncy Street, BOSTON.
239 Fifth Avenue, CHICAGO.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

E. C. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1926 FRANKLIN NEW YORK.

Speed & Stephenson,
WORSTED and WOOLEN
YARNS
A SPECIALTY.
ALSO TOPS.
170 SUMMER ST., BOSTON.
Long Distance Tel. 4168-2 Main.

FIRE HOSE CORDS — From long staple cotton—6s to 20s yarn in 2 to 100 ply—16 lbs. without a knot.
COTTON WARPS — On beams—single or ply yarns, grey, bleached or colored.
GLAZED YARNS — All plys—any color—for braiders, harness and sewing threads.
UNIVERSAL WIND — For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed. We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, SPRINGFIELD, MASS, MILL: CHATTAHOOCHEE, GA.

the duplicate business is as good as anticipated it cannot last longer than August.

The light weight business will be run on the same lines as the heavy weight business now on. Prices for cloth being high buyers purchase only in small amounts. The clay worsted business will improve after June and perhaps by last of August some orders will be secured. Some of the worsted weavers are able to run only by using woolen yarn run with a worsted thread to reduce the cost. Some of the weavers, even though they know they must purchase yarn, say that they can see no necessity of placing orders with the prices of yarn in their present state, and shall not hurry themselves in placing orders if they have any.

One of the causes of the present condition of business is caused by the method of buying. The weavers manufacture to meet a certain price which cloth buyers insist upon, and if worsted yarn advances too much other yarns are substituted, cotton or woolen, anything goes to meet the popular price.

When prices become nominal the better grades are again used.

The bunting manufacturers and the dress goods manufacturers have secured good orders and have business enough to last until well into the season. The dress goods manufacturers are some of them using carpet yarn to produce certain dress goods effects. Much novelty yarn is being used.

The bunting manufacturers state that while their business is good yet the slightest advance causes a loss of orders at once. Even an advance of 12 1/2 cents on a 40 yard piece causes orders to stop. The French yarn spinners are fairly busy for the time being but the orders now being run were placed even before the advance in wool took place. Top makers are not busy but the prices on the finer tops are fully maintained. The bulk of the top orders are on 1/4 to 3/8 Blood work, but trade is slow. We quote as follows:

2/40's Australian	1.25
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ¾ Blood	.75
2/26's ¼ Blood	.68

Woolen Yarn.

Spinners continue busy although orders are falling off with a poor outlook. Spinners in many instances can see the end of their orders and unless new ones are secured the spinners may have a dull period. The business of the spinners is shifting from one class of orders to another class. The machinery which has been employed on over coating yarn is now being turned on hosiery yarn and on yarn for cloth weavers, the general trend, however, is towards slowing up although spinners are well employed at present.

The difference to be noted is that where two months back it was impossible to get yarn made at any price at the present time spinners are beginning to get anxious about future orders. At present the worsted weavers and the hosiery manufacturers are the two branches which are the largest users of yarn. Many of these mills are using from contracts placed earlier in the season,

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

IF you have any problem in connection with lubrication which you can solve to your own satisfaction, we are willing to put our time against yours to prove that Dixon's Flake Graphite is the solution. Ask for booklet 120-c.
JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.

A New Book for Designers and Weavers.
MANUAL OF WEAVE CONSTRUCTION,
By IVO KASTANEK,
One of the Leading Authorities on this Subject in Europe.
Translated and Arranged for American Practice by Samuel S. Dale.
In this book all the foundation and derivative weaves for harness looms are systematically classified and explained.
The weaves are divided into three general classes, plain, twill and satin. Under each of these divisions are given rules for constructing derivative weaves, which are illustrated with over Five Hundred Drafts, Diagrams and Illustrations of cloth samples.
For self-instruction the workers in the mill find it of great value and as a book of reference it is equally well adapted for the practical weaver, designer and the superintendent.
There are over Five Hundred Illustrations and Diagrams, many showing the cloth with weave construction.
Over One Hundred Pages. Handsomely Bound in Green Cloth and Gold. Price, $1.50.
LORD & NAGLE COMPANY,
95 SOUTH ST., BOSTON, MASS.

Woolen and Merino YARNS
Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL. - - LEOMINSTER, MASS.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
223 and 225 Chestnut Street,
PHILADELPHIA, PA.

SHODDY WM. H. H. SLACK & BRO., Springfield, Vt.
Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.
RIVERDALE WOOLEN CO., MANUFACTURERS OF
.. Shoddies ..
Of every description. Capacity 7,000,000 pounds per annum.
Custom Carbonizing and Garnetting a Specialty.
New York Office.
140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

but in some instances new orders have been placed. Some worsted weavers are running on woolen yarn largely and are able to keep their mills running by using this class of yarn.

Woolen yarn is being used for filling of worsted cloth and for doubling with a worsted thread. It is predicted that the light weight worsteds will also be made with woolen yarn. The fine worsted mills are using much woolen spun yarn in place of worsted yarn. Some very fine spun yarn is being made requiring a double spinning. These mills are using woolen yarn as fine as 10 run.

The hosiery manufacturers are using much woolen yarn, but are buying cautiously and are buying but a small proportion of their requirements.

Much of this yarn has been displaced by using a 10's mule spun cotton yarn, but the trade is getting back to woolen hosiery and much more woolen yarn will be used for this purpose. Then again yarns for French flannels are in demand and the mills which are in a position to handle this class of yarn are well employed.

The rubber boot lining trade continues good and much yarn is being delivered for this purpose. The underwear manufacturers are busy, but are buying only from hand to mouth and will buy stock only as they require it. All of them are lowering the grades of garments to meet the prices of the buyers.

Prices for fine wools and yarns from fine wools are no lower. In London the demand for fine wool has been active and has advanced from 5 to 10 per cent. over the last sales. German manufacturers secured the greater part of the clip of fine merinos. The machinery of the combing mills is not running its full. It is stated that the bulk of the business of the mills in England is on cheap substitutes, the same as in our own country. The outlook in Australia for lambs' wool is not good and prices are liable to rule high during next season. It is a curious fact that medium merino Australian lambs' wool has, since the advance began in this article, advanced 50 per cent., while super merinos have advanced but 20 per cent. This was caused by there being a stock on hand in Australia, but prices are all beyond the requirements of knitters in this country, who have substituted different material. Some have used fine noils and some knitters have been using Australian crossbred noils mixed with fine imported Australian thread waste.

Rag and Shoddy Market.

Business is very quiet in these markets and, while prices for the better grades are firm, there has been a perceptible weakening in the position of low qualities. That prices have not receded is due to the knowledge on the part of dealers that it would be useless to try to move stocks in large quantities by lowering prices, because the manufacturer of goods is in no need of raw material.

The close of the heavy-weight season materially reduces the consumption of short stock, and there is not the faintest disposition on the part of spinners to anticipate their wants for any considerable time. The rise in cotton has strengthened the cotton-waste market, but outside of this dullness

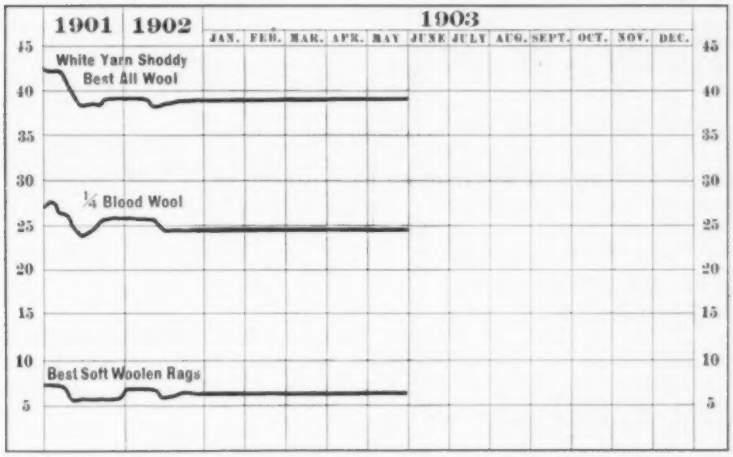


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

and a tendency to depression of prices is the rule. This tendency is not yet under sufficient headway to warrant any change in quotations. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool 38-40
White knit, all wool, best, fine 28-32
White knit, No. 2 23-25
Light yarn, extra fine 25-28
New pure indigo blue 23-25
Fine worsted, new black 26
New blue clip, best, fine 20-22
Dark mixed yarn, extra fine 22-24
All wool yarn, medium and coarse grades.... 15-20

Merino.

Fine light, all wool, No. 1 24-25
Medium light, all wool, No. 1 ..... 16½-17½
Medium light, all wool, No. 2 14-16
Fine black, all wool 20-22
Fine dark, all wool, best grade 20-21
Medium dark, all wool, No. 1 13-15
Medium dark, all wool, No. 2 12-13
Red knit stock, strictly all wool 19-20
Red flannel, all wool 19-20
Dark blue for hosiery, strictly all wool, No. 1 17-20
Dark blue for hosiery, not all wool, No. 2.... 12-14

DELAINE EXTRACTS.

Light 19-22
Medium light 15-17
Regular gray 12-13
Black 14-15
Fancy colors 16-20

WOOLEN RAGS.

Fine merchant tailors, all colors 10½-12
Choice light colors 13-15
Browns 12-13
Blacks 9½-10½
Fine blues, plain 11-12
Fine dark 10-11
Medium dark 7-8

Worsteds.

Blue 16-18
Black 21-23

Serges.

New black 15-16
New blue 16-17

Flannels.

New scarlet 18½-22
New blue 17-18
Cloakings 3-4

SOFTS AND KNIT STOCK.

Soft woolens, best 7-7½
Old white flannels 14-16
White flannels, No. 2 11-12
Old red flannels 9½-10
Light blue flannels 7½-9
Old blue flannels 6-7
Old plaids 5-7
White stockings 17-18
White hood stock 20-21
Clear hoods 9-10
Red stockings 9-10
Blue stockings 8-9
Fancy stockings, No. 1 7-9
Gray stockings 9-10
Black stockings 9-10
Knit stock comforters 6-7½
Red knit 9-10
Light gray knit 9-10
New light fancies 16-18
New fancies 12-14

Merinos.

Light, fine 15½-16
Light, coarse 8-8½
Fine, dark 11-12½
Dark, No. 2 ..... 5-6½
Coarse dark 4-4½
Blue 10½-11½
Blue—seamed 14-15
Black—unseamed 11-12
New black 18-20
Small 3¼-4
Bunting 6-8

FLOCKS.

Shear, fine white, all wool 9-11
Fine indigo blue, all wool 9-9½

Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

CHAS. W. BECKER, Agt.,
Amsterdam, N. Y.

Address Dept. 7.

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	9½-10
No. 1 Machine	5-5½
No. 2 Machine	4½-5
Machine Cop	5½-6
No. 1 Cop	6½-7
No. 1 Card	7½-8
No. 2 Card	5-5½
No. 1 Oily Card	4-4½
No. 2 Oily Card	3¼-3¾
Egyptian Card	9¾-10
Peeler Combing	10¼-10½
Egyptian Combing	10¼-10½
No. 1 Linters	3½-4½
No. 2 Linters	3-3½
White Clips	5¾-6¼
Colored Clips	2¾-4¼
No. 1 Picker	2½-3

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

*Massachusetts, Cherry Valley. Work has been completed on addition to weave room of the Geo. W. Olney Woolen Co.'s mill. They will install 12 new looms, which will soon be running.

*Massachusetts, Cherry Valley. The Chapel Mills Mfg. Co., recently reported having purchased A. W. Darling's mill, will operate same as the "Bottomly Dept." of the Chapel Mills Manufacturing Co. The capital stock of the company is to be increased to $100,000. Improvements will be made to the mill, which is equipped with 4 sets cards and 50 looms, with finishing machinery, will be operated on same class of goods made at the Chapel plant.

Massachusetts, Webster. Improvements and alterations are being made to Josiah Perry's woolen mill.

Massachusetts, West Rutland. A new engine and boiler room, 40 by 50 feet, is to be built for the Lakeville Woolen Company. They will install new engine and boilers in same.

Massachusetts, Worcester. A central power house, from which the three separate plants of the Whittall Carpet Co. will receive power, is to be built. Work has been started on the preliminary plans for same.

Massachusetts, Worcester. The A. W. Darling Mill, Valley Falls, has been incorporated as the A. W. Darling Manufacturing Company. J. Kaplan of New York is president of the new company; A. W. Darling, treasurer and manager. Capital stock is placed at $15,000.

Michigan, Clinton. Three additional sets cards and 15 looms are to be installed in the Clinton Manufacturing Co.'s mill. A new weave shed will be built. The carding and other departments are to be greatly improved. They now operate 45 looms and 9 sets cards, making men's wear fancy suitings, uniform cloths, fancy cassimeres and overcoatings.

New Jersey, Newark. A new two story mill, 100 by 50 feet, is to be built for Basch & Greenfield, manufacturers of shoddies, etc. They will install carbonizing machinery, increasing capacity of the plant 10,000 lbs. daily.

New Mexico, Albuquerque. The Albuquerque Wool Scouring Co. has started operations in their new 2-story wooden building. This plant has a capacity of 24,000 pounds in 24 hours. J. H. Bearrup is president and V. P. Edie, secretary and treasurer.

New York, Binghamton. Plans have been completed for an enlargement to the Binghamton Felt Company's mill. New machinery will be installed for making finer felts, for millinery and shoe trade. About 100 more people will be employed.

New York, Marlboro. Some additions are being made to the machinery equipment of Sutcliffe Bros.' mill.

WHERE TO LOCATE NEW FACTORIES IN NEW ENGLAND

The BOSTON AND ALBANY R. R. (New England's Two-track Trunk Line) is desirous of calling the attention of capitalists and manufacturers to the ADVATAGES POSSESSED BY THE DIFFERENT CITIES AND TOWNS ON THEIR MAIN AND BRANCH LINES in the shape of

Unexcelled Sites for New Mills.
Unlimited Freight Facilities to all parts.
Close Proximity to Distributing Centres.
Plenty of Good and Intelligent Help.
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No. 1 Cop	6½-7
No. 1 Card	7½-8
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No. 2 Oily Card	3¼-3¾
Egyptian Card	9¾-10
Peeler Combing	10¼-10½
Egyptian Combing	10¼-10½
No. 1 Linters	3½-4½
No. 2 Linters	3-3½
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Colored Clips	2¾-4¾
No. 1 Picker	2½-3

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Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
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Carpet (white)	14-18
Carpet (colored)	10-12½

Seedy.

½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

*Massachusetts, Cherry Valley. Work has been completed on addition to weave room of the Geo. W. Olney Woolen Co.'s mill. They will install 12 new looms, which will soon be running.

*Massachusetts, Cherry Valley. The Chapel Mills Mfg. Co., recently reported having purchased A. W. Darling's mill, will operate same as the "Bottomly Dept." of the Chapel Mills Manufacturing Co. The capital stock of the company is to be increased to $100,000. Improvements will be made to the mill, which is equipped with 4 sets cards and 50 looms, with finishing machinery, will be operated on same class of goods made at the Chapel plant.

Massachusetts, Webster. Improvements and alterations are being made to Josiah Perry's woolen mill.

Massachusetts, West Rutland. A new engine and boiler room, 40 by 50 feet, is to be built for the Lakeville Woolen Company. They will install new engine and boilers in same.

Massachusetts, Worcester. A central power house, from which the three separate plants of the Whittall Carpet Co. will receive power, is to be built. Work has been started on the preliminary plans for same.

Massachusetts, Worcester. The A. W. Darling Mill, Valley Falls, has been incorporated as the A. W. Darling Manufacturing Company. J. Kaplan of New York is president of the new company; A. W. Darling, treasurer and manager. Capital stock is placed at $15,000.

Michigan, Clinton. Three additional sets cards and 15 looms are to be installed in the Clinton Manufacturing Co.'s mill. A new weave shed will be built. The carding and other departments are to be greatly improved. They now operate 45 looms and 9 sets cards, making men's wear fancy suitings, uniform cloths, fancy cassimeres and overcoatings.

New Jersey, Newark. A new two story mill, 100 by 50 feet, is to be built for Basch & Greenfield, manufacturers of shoddies, etc. They will install carbonizing machinery, increasing capacity of the plant 10,000 lbs. daily.

New Mexico, Albuquerque. The Albuquerque Wool Scouring Co. has started operations in their new 2-story wooden building. This plant has a capacity of 24,000 pounds in 24 hours. J. H. Bearrup is president and V. P. Edie, secretary and treasurer.

New York, Binghamton. Plans have been completed for an enlargement to the Binghamton Felt Company's mill. New machinery will be installed for making finer felts, for millinery and shoe trade. About 100 more people will be employed.

New York, Marlboro. Some additions are being made to the machinery equipment of Sutcliffe Bros.' mill.

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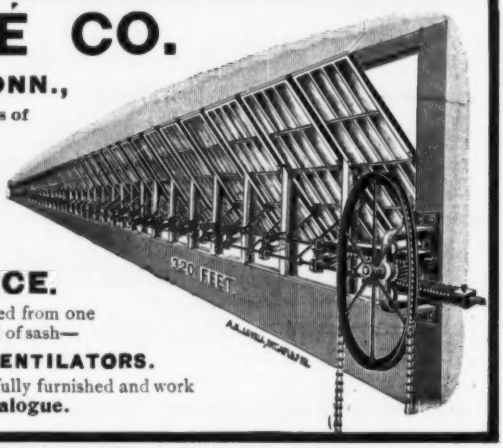

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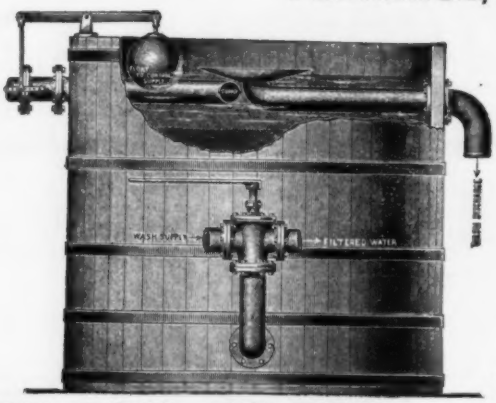

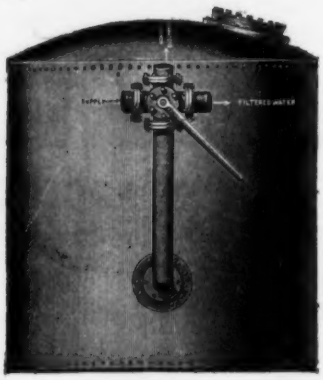

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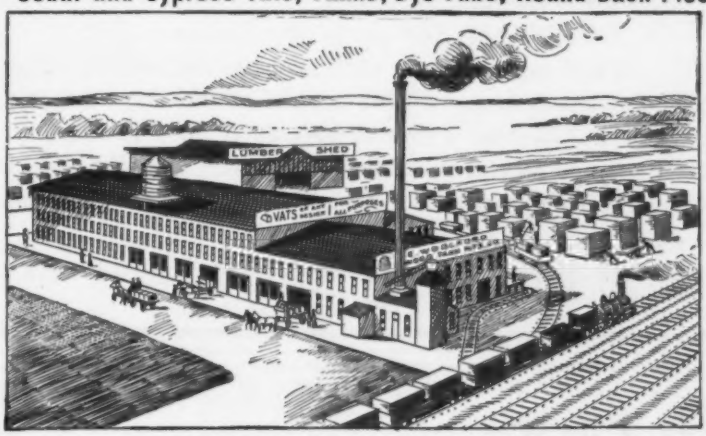

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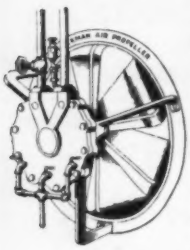

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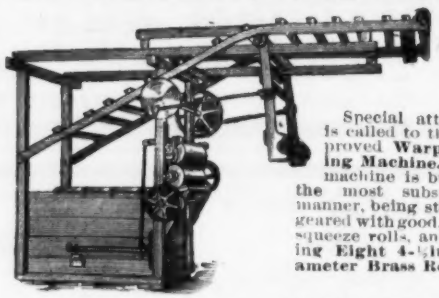
For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

E. M. NICHOLS,

Arch St., - PHILADELPHIA, PA.

Write for particulars.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-½in. Diameter Brass Rolls.**

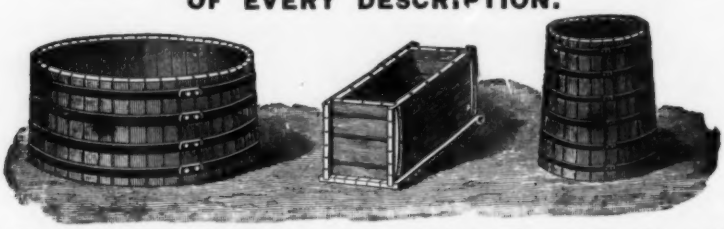
This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,

Hedge and Brown Streets, FRANKFORD, PHILA.

Cypress Tanks and Vats

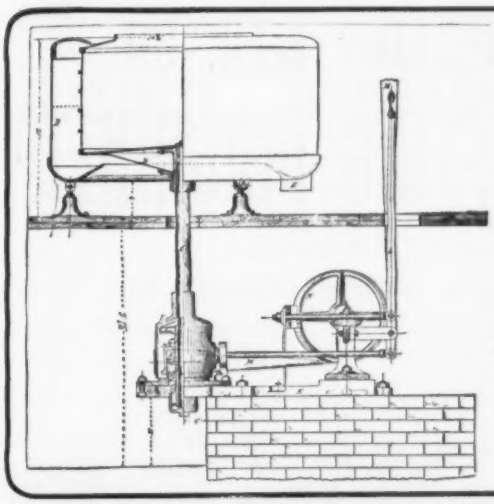
OF EVERY DESCRIPTION.



Cypress is remarkable for its great durability. There is no other wood so well adapted for the manufacture of Tanks, Vats, Cisterns, Dye Tubs, etc. We handle Cypress from the Stump, and our stock is of the best.

Our Tank Factory is complete. Let us know your wants.

THE A. T. STEARNS LUMBER CO., BOSTON.



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Special Machines for Acid Work.

SHAFTING, PULLEYS,
FRICTION CLUTCHES, Etc.

American Tool and Machine Co.,

Incorporated 1864. Founded 1845.

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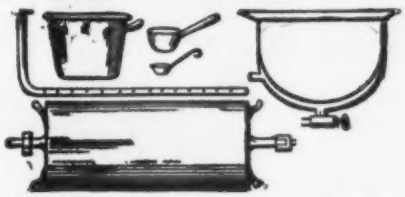

Copper Steam Pipes, Coils, Dippers, Steam Boards and Heavy-Tinned Steam Cylinders,

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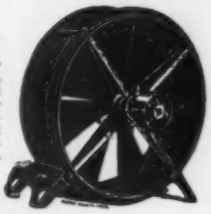
Repairing Neatly Done.

NEW ENGLAND VENTILATING & HEATING COMPANY.

Ventilating, Heating, Humidifying, Cotton and Wool Conveying by Blower System, Tin Cylinders, Roving and Drawing Cans, Separators, Tape Pulleys.



FACTORY AND OFFICE:

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TWO BIG FACTORIES.

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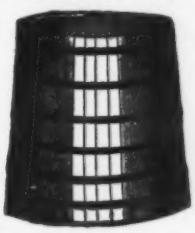

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INTERNATIONAL SPRINKLER CO. TRADE MARK REGISTERED

Main Offices and Works
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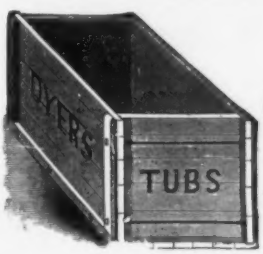
Actively represented all over United States and Canada.

Manufactures and installs sprinkler heads, dry valves and alarm valves. Universally approved by insurance interests. Write for full particulars.



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Manufacturers of

Cedar Vats and Tanks

2915-2933 North Second Street,

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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.

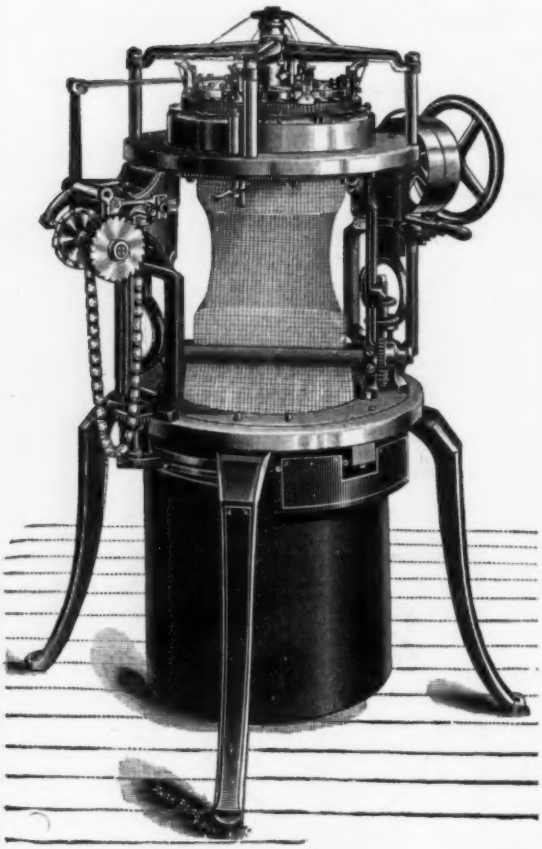
Hours from 12 to 1.

McMICHAEL & WILDMAN MFG. CO.

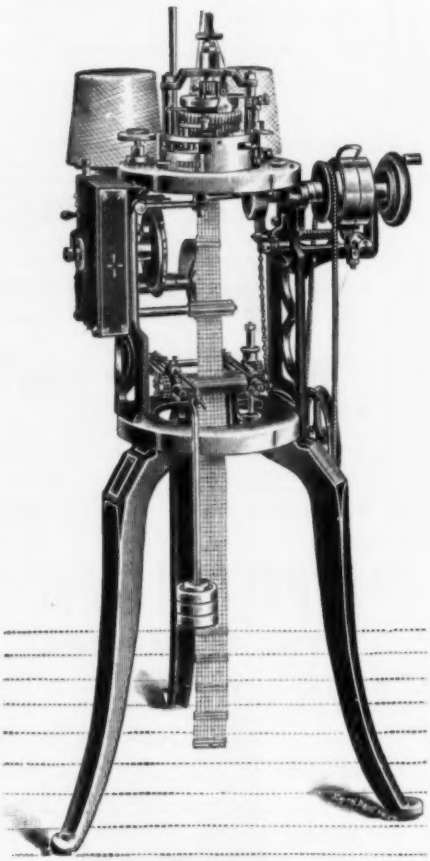
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

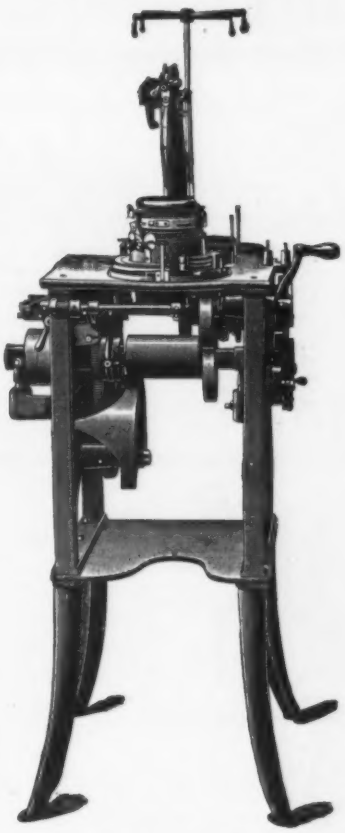
McMICHAEL & WILDMAN MFG. CO.

NORRISTOWN, PENN.

Acme Automatic Knitter

FOR SEAMLESS HOSIERY

ALL KINDS AND GAUGES



Best method of transferring ribbed legs and tops.

Greatest production of perfect work at least cost.

All latest attachments and improvements.

Our new type of machine, just out, having absolutely positive feed on pattern mechanism, which is set by dial, and graduated disc when changing styles and sizes, is one of the greatest improvements in knitting machines for a long time.

For particulars address

MAYO KNITTING MACHINE & NEEDLE CO., FRANKLIN FALLS, N. H.

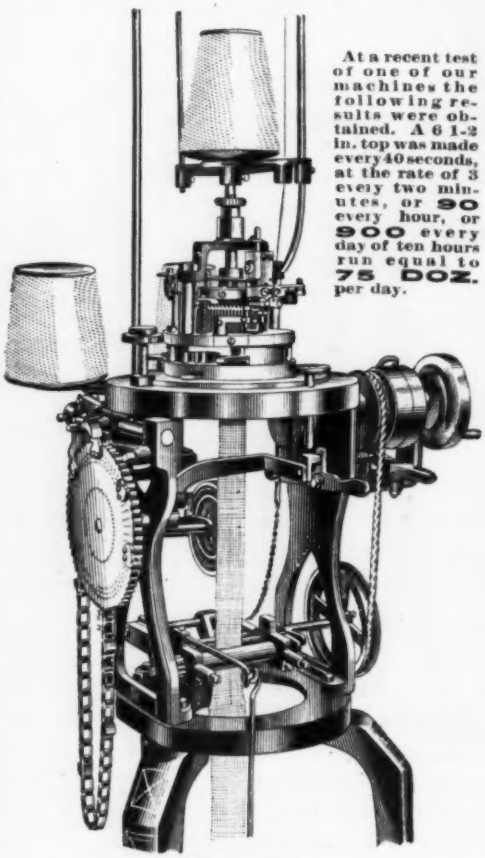
Philadelphia Office: Knickerbocker Building, Cor. 6th and Arch Sts.

We manufacture all kinds of Latch Needles of superior quality.

Write today to the manufacturers of the celebrated

Ruth Automatic Machines

for the most liberal and fairest proposition ever offered



At a recent test of one of our machines the following results were obtained. A 6 1-2 in. top was made every 40 seconds, at the rate of 3 every two minutes, or 90 every hour, or 900 every day of ten hours run equal to 75 DOZ. per day.

PATENTEES AND MANUFACTURERS OF

Ruth Ribber, Ruth Sleever, Ruth Splicer, Ruth Automatic Stop Motion, Ruth Lace Device, Ruth Friction Pulley, Ruth Belt Shift, Ruth Needles.

ALL manufacturers of Hosiery should investigate the proposition referred to and take advantage of this chance to prove the merits of the best machines, costing the **least** money and having the record for the **highest** producing power.

¶ The new RUTH AUTOMATIC STOP MOTION is now ready for delivery, this attachment combines everything that can possibly be covered in the use of a Stop Motion, **new** and **novel** contrivances, simple in themselves but far reaching in their usefulness are embodied in this the latest production of the home of **original** and **practical** improvements in hosiery machines.

¶ The products of this plant are noted for their *simplicity and durability*, together with most positive action of every part. Changes from one line to another can be made almost immediately. They excel in production of most perfect work, with fewer broken needles and minimum number of "seconds."

¶ These products *cost less* and have a *higher* earning power than any other. With all the advantages named the chiefest is not overlooked and that is the best quality of fabric that can be produced. *Absolute guarantee with every machine. Every machine full automatic.*

Ruth Automatic Knitting Machine Co. Box T-W, YORK, PA. Formerly of Norristown, Pa.

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SPRING 1904 LINE

EDGINGS AND BRAIDS

conceded by competent judges

Head and Shoulders

above all previous efforts both in design and price : : : :

ALL GOODS SOLD DIRECT

Mills at Germantown, Phila.

P. O. ADDRESS, LOGAN STATION, PHILA.

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MANUFACTURERS OF

Circular Rib Knitting Machinery,

UNDERWEAR MACHINERY,

For Ladies' Vests, Combination Suits, Corset Covers, etc., Men's Underwear, Sweaters, etc.

New Improved Sleeve Machines, Machines for Rib Hosiery, Rib Tops and Cuffs.

LATEST IMPROVEMENTS ON ALL MACHINES.

MECHANICAL STOP MOTIONS

For Circular Rib Knitting Machines.

OFFICE AND SHOW ROOMS:

606 ARCH STREET, PHILADELPHIA.

The "INVINCIBLE"

A machine of the highest grade.

Practical and Economical in operation.

A Big Producer.

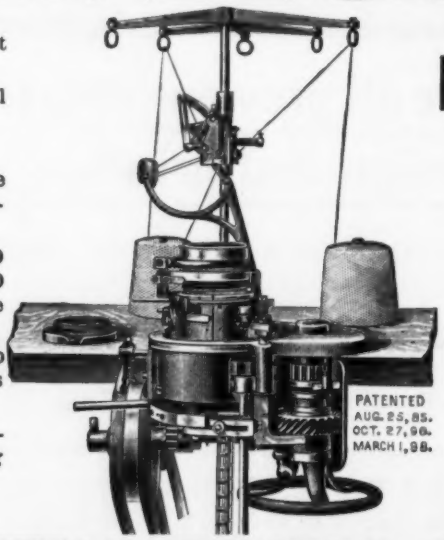
Gauge of machine changed by simple changing cylinders.

The Invincible **METHOD OF TRANSFERRING RIBBED TOPS** is quicker and more positive than others.

No experience required to transfer ribbed tops by this method.

YARN CHANGED automatically without revolving bobbins.

Write for Catalogue.

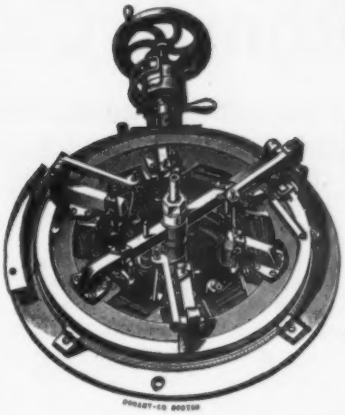


Full Automatic Knitting Machine

For all kinds and gauges of

SEAMLESS HOSIERY

PAWTUCKET, R.I. U. S. A. **E. JENCKES MFG. CO.** BRANCH OFFICE, Room 370, Bourse Bld'g, PHILADA, PA.



CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

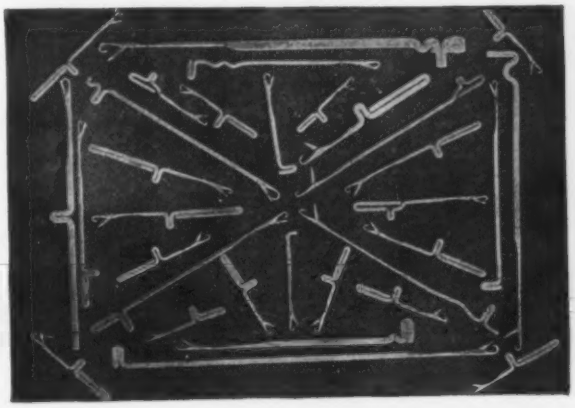
The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.



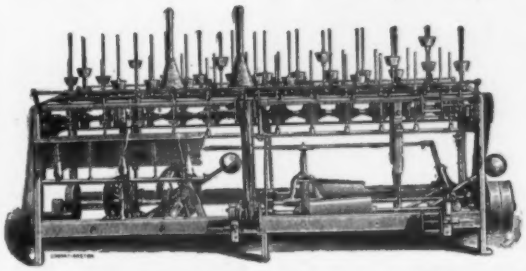
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



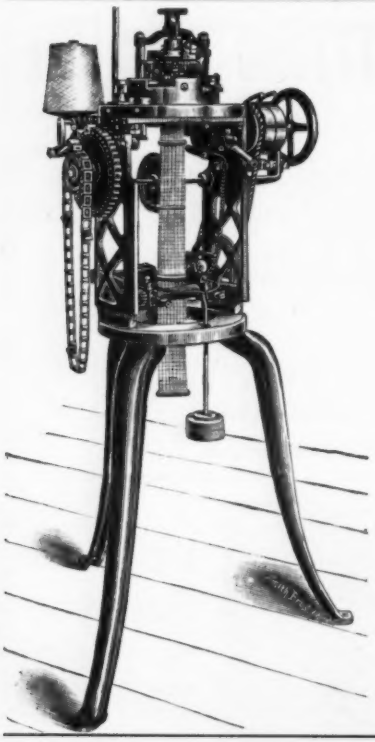
ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.



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213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

Adams Rib and Top Cutting Machine

FULLY AUTOMATIC.

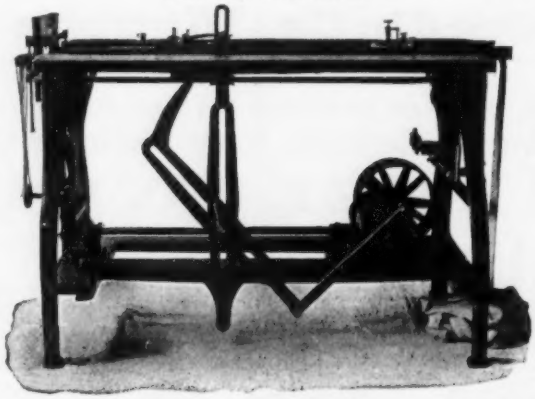
Cuts all Fabrics with or without Welts. Requires no trimming after passing through machne. Perfectly clean work.

Solidity.

Simplicity.

Absolute Positive Movements.

Best Materials.



Cutting and Working Parts Hardened Steel.

Easy Running.

False Welts cut out automatically. 1,500 dozen pairs, cut per day by one operator.

Saving of Labor and Goods. Can be operated by boy or girl. Accidents impossible. No Special Attachments. Patented in the U. S. A. and Europe.

Sole Manufacturers and Agents for the U. S. A.,

McMichael & Wildman Manufacturing Co., Norristown, Pa

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MANUFACTURER OF

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Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder. **Spring Needle Cylinder Rib-Top Machines,** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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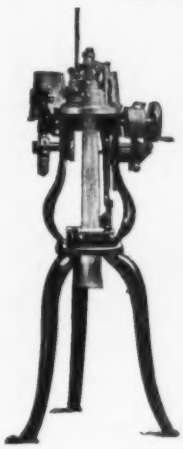
Pepper Machine Works

Lakeport, N. H.

Successors to
Pepper Manufacturing Co.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. **Correspondence Solicited.**

Standard Machine

Superior to All Others in Economy of Operation, Production and Fabric.

Best Built, Easiest Operated, Superior Fabric.

STANDARD B, Automatic Double Sole and all Improvements. STANDARD C, the only Automatic Heel and Toe Changer. STANDARD D, Automatic Striping Machine, None other in the market.

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508 Ludlow St., PHILADELPHIA, PA.
Estimates Furnished for Complete Hosiery Plant.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. **NEW AND SECOND HAND.**

A RARE OPPORTUNITY TO BUY.

1 Reliance hollow plate screw press, 10 plates 34 by 45.
3 Lever hosiery presses.
16 Beattie loopers, 14, 16 and 18 point.
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1 McCreary Brusher, 36 inch.
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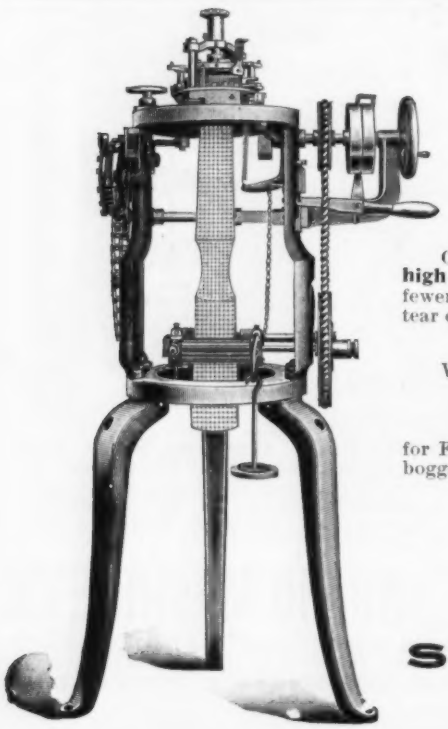
23 Ribbed underwear machines, 6 to 20 inch.
1 plant of 20 Kutz auto. knitters, 176 needles, with engine, boiler and full complement of all machines necessary for making hosiery.
66 Brinton ¾ auto. knitters, sizes 2½ to 3½ in.
100 Welting and trimming machines.
20 McMichael & Wildman automatic ribbers and sleevers.
2 Skein winders, 24 spindles.
1 Cop winder, 42 spindles.
2 Double Rib Machines.
1 Warping mill and creel.

WRITE FOR COMPLETE LIST.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed,** giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

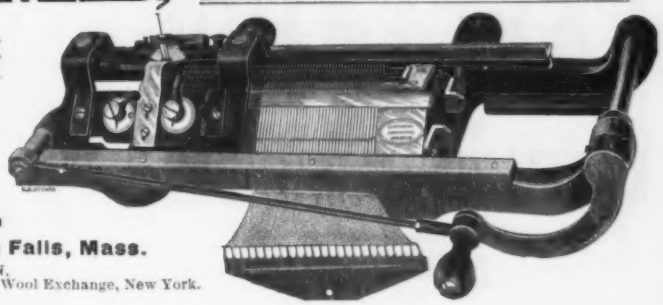
LITTLE FALLS, N. Y.

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 505 Wool Exchange, New York.

THE BEST

Full-Fashioned Hosiery Machines

Simplicity, durability, large production, fine work are the characteristics of the machines for knitting fashioned hosiery made by the

CHEMNITZER

WIRKWAAREN - MASCHINENFABRIK

(Formerly Schubert & Salzer)

CHEMNITZ, GERMANY.

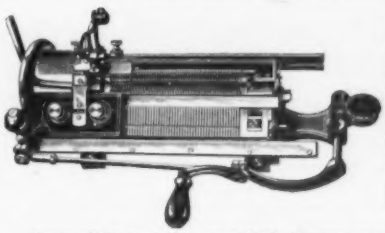
Representative for the United States,

OTTO WALTHER, 591 Bourse Building, Philadelphia.

Best Knitting Machines

IMPROVED CONSTRUCTION

For Hand and Power Driving.



High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

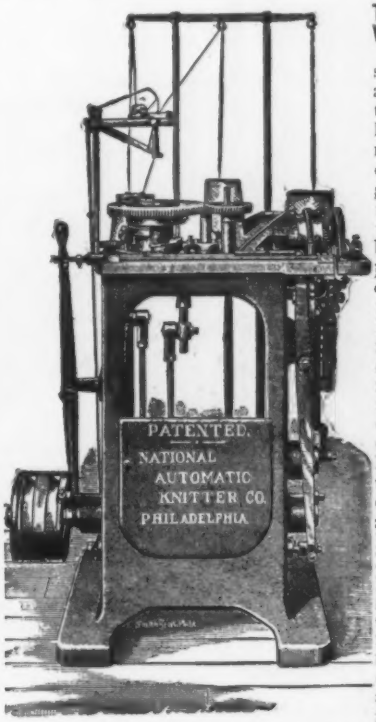
CLAES & FLENTJE,

Muhlhausen, Thür, Germany.

National Spring-Beard Needle MACHINE

For Seamless Hosiery.

The only Machine on which the speed is advertised.



This Tells the Whole Story.

Best results guaranteed at 300 to 400 revolutions per minute, according to guage, hence the largest production by 25 to 40 per cent. over all other machines. Least cost for repairs, smallest needle breakage and lowest per cent. of menders. Full automatic, practical double-sole and high-heel splicer. Device for producing a great variety of lace effects, with no breakage of stitches and no infringement.

For full particulars, call or address

NATIONAL AUTOMATIC KNITTER CO.,

724, 726, 728 Cherry Street,

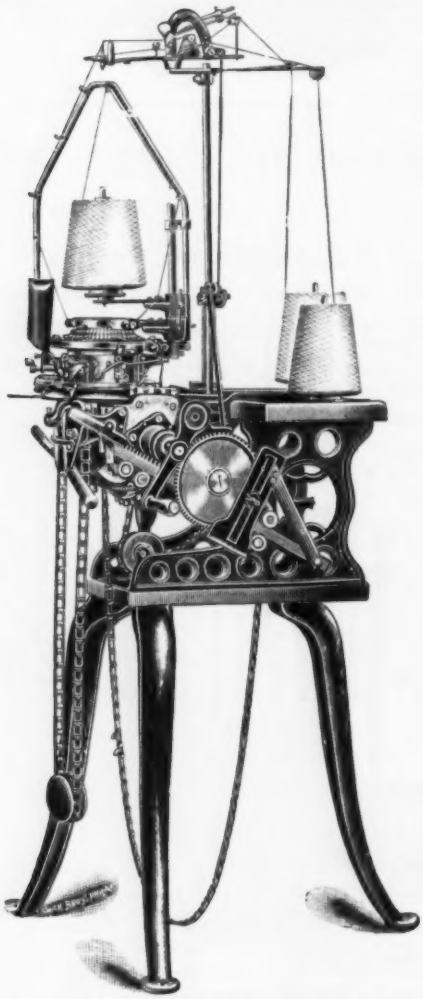
PHILADELPHIA.

EXCELSIOR

Knitting Machine Mfg. Co.

BUILDERS OF

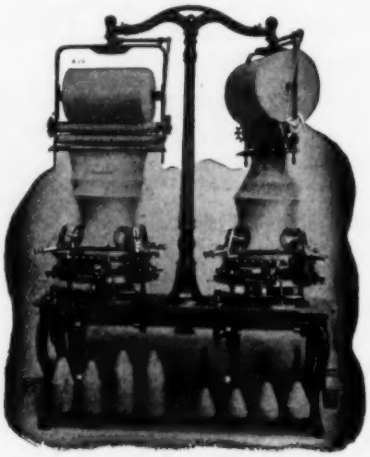
KNITTING MACHINERY



Two-Feed 7-8 Automatic for Ladies String Work, also Black Legs with White Feet.

Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.

Allentown, Pa., U. S. A.



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Knitters, Winders, Burrs, Attachments.

The New "Victor"

KNITTING MACHINE.

A full automatic seamless machine, thoroughly interchangeable in all its parts. More simply constructed than any other.

Also full automatic **Two-color Striping Machine** and automatic lace and stripe machine.

AMERICAN KNITTING MACHINE CO.,

Main Office, Knickerbocker Bldg., Cor. Sixth and Arch Sts., Philadelphia, Pa.

Southern Branch, Hendersonville, N. C., R. M. Oates, Representative.

Factory at Woonsocket, R. I.

CELEBRATED BRAND PYRAMID TRADE MARK **LACINGS**

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,
115 Franklin Street, NEW YORK.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

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3-4 AUTOMATIC KNITTER

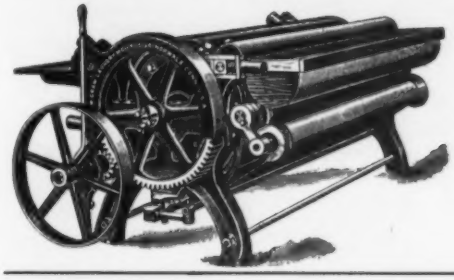
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and bet er goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

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Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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Hosiery Boards.

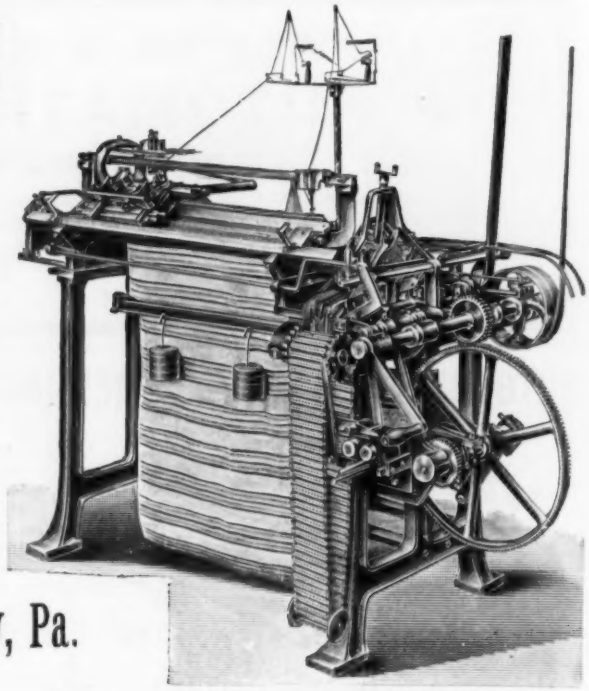
German Knitting Machinery

For Fancy and Full Fashioned Goods.

Our Specialties are for Machines for Knitting **SWEATERS, GOLF JACKETS, FANCY VESTS, Etc., in Plain, Honeycombed and Other Fancy Stitches.**

Our Steam Power Machines are fully Automatic. One operator attends four machines.

Also Hand Power Machinery. Also Underwear, Glove and Mitten Machinery.



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Importer and Builder of

Full Fashioned Knitting Machinery

N. E. Corner Third and Green Streets, PHILADELPHIA, PA.

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Hosiery Machinery

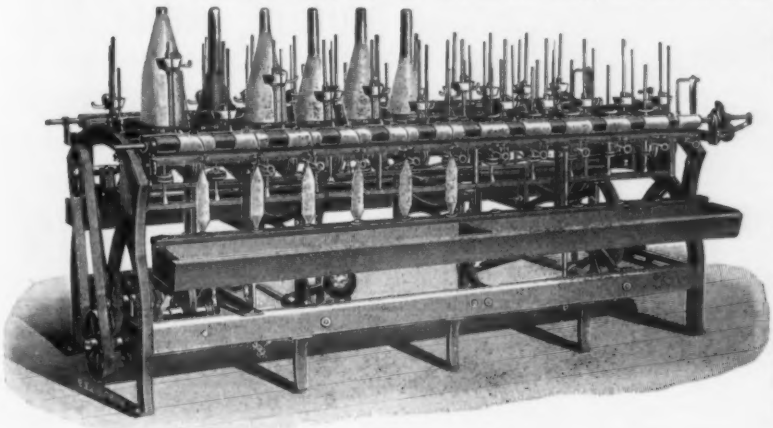
can possibly be given and we ask all interested to apply to us. Will be sent post free on application to WILDT & CO., Leicester, England.

Agents for Bolton's Unshrinkable Process for which the sole right for U. S. A. is for disposal.

Has already been sold for Canada, Germany, England, Norway and Sweden, Denmark, Italy, Switzerland, Etc.

OVER 1,400 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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Builders of the

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Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

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We HARDEN all CYLINDERS and DIALS large and small.

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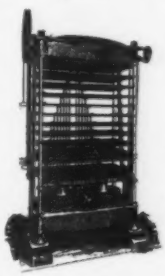

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PLATE PRESS

For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

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Successors to
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Established 1868.

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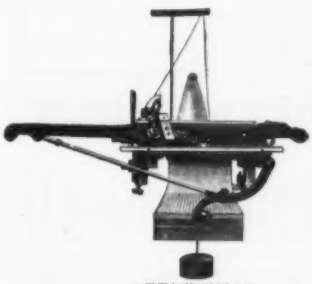
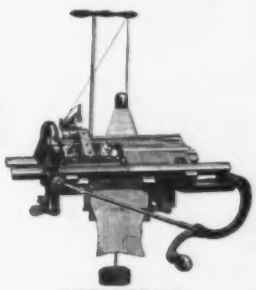


"TEUTONIA"

BUILDERS OF ALL KINDS OF

Flat Knitting Machines

(LATCH NEEDLES.)



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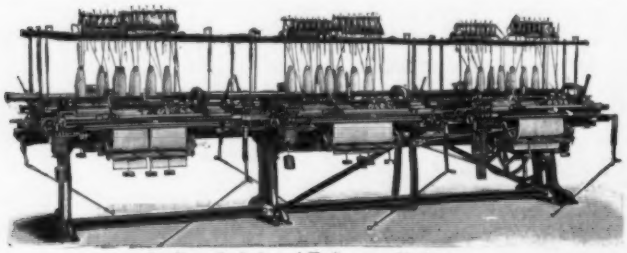
More than thirty different Models of **Hand Knitting Machines.** Special Machinery for Fancy Gloves, Fronts of Cardigan Jackets, Golf Hose, Sweaters, etc., etc. **Patentees and Sole Makers of the "TEUTONIA" KNITTER** the very best hand-machine for the manufacture of plain, seamless hose and half hose with Griswold heel, narrowed leg and toe. **FULL AUTOMATIC POWER KNITTING MACHINES, Independent Heads,** for making Rib Tops, Sweaters in 1 and 1 and Half Cardigan Rib, 2 and 2 Ribbed Ladies' Vests, Scarfs, Shirt and Shaker Bodies, etc. **FULL AUTOMATIC FANCY JACQUARD KNITTING MACHINES, Power Motion. AUTOMATIC NARROWING MACHINES—Power Motion—3, 4, 6, 8, 10 heads** for making plain, seamless legs of Ladies' Hose (full fashioned), plain, fashioned seamless Pants and Sleeves, Ribbed Pants and Sleeves, Cardigan Jackets, Cardigan Sleeves (narrowed and widened), etc.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

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For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

Paris, 1900, Gold Medal.

Ask for samples and particulars, state gauge and size you want.

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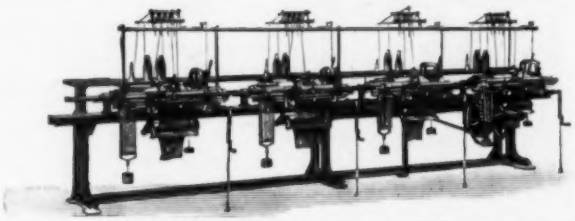

Automatic Widening Machine for Sleeves, Drawers, Garments, Plain and Ribbed.

New Automatic Power Neck

AND CENTRE MARKING MACHINE (Patented)

For Marking or Crimping the Neck and Centre of Garment for Cutter. The original and best machine in use for this purpose. Fully covered and protected by Letters Patent.

Special Machines for Knitting Mills

Band Folding and Cutting Machines, Power Neck Marking and Shaping Machines, Hand and Power Cloth Cutters, Flat Rib Cutters, Folders and Winders, Loopers, Hot Roll Folders, Eyelet Machine, Irregular Form Cutting Machines.

ALSO FULL LINE OF KNITTING MILL SUPPLIES. Send for Circulars

THOMAS KENNEDY & SON, Cohoes, N.Y.

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BEST WORKMANSHIP.

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OF EVERY VARIETY.

HOSIERY BOARDS

Our line of hosiery and Dye Boards is meeting with universal favor. We also manufacture a superior line of bobbins. Write for our prices.

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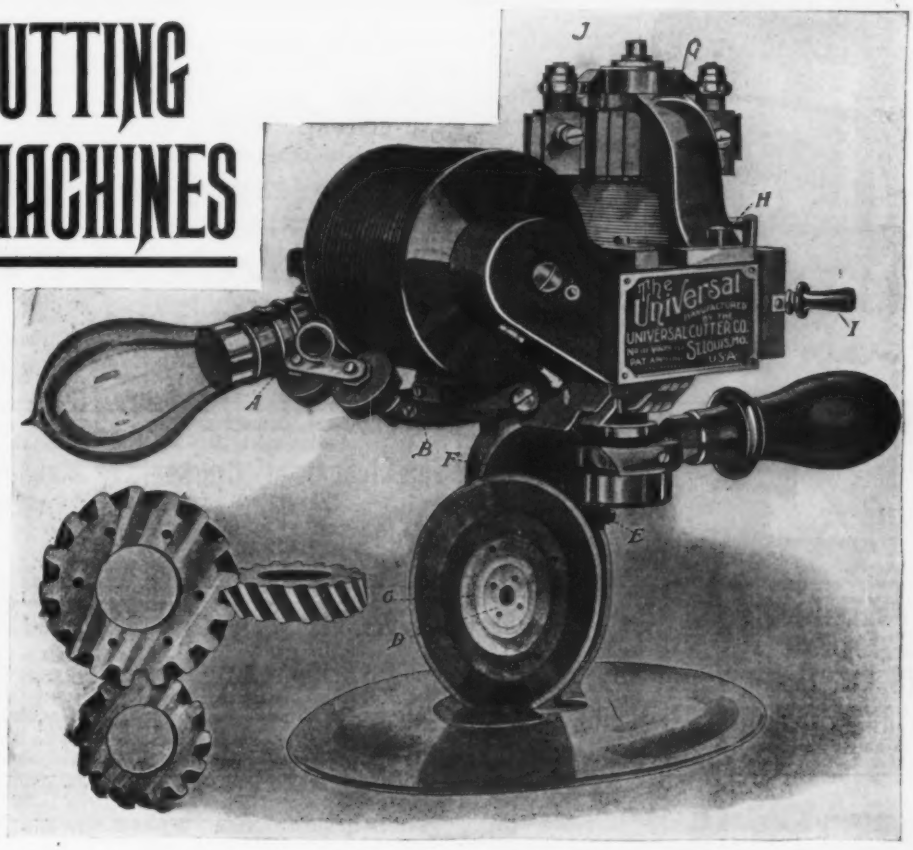
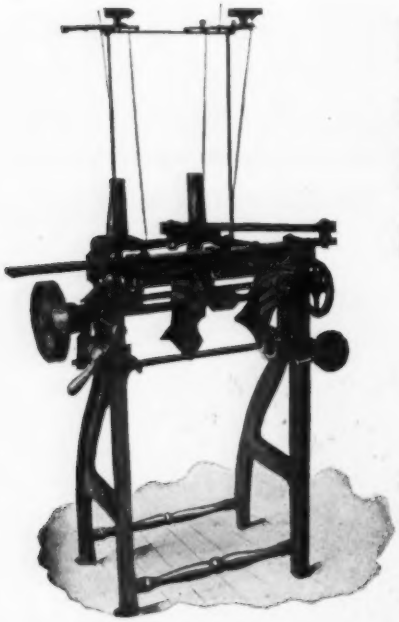


Made to be operated by direct current, 110 or 220 volts.
What electric current have you?

UNIVERSAL CUTTER WILL DO THE WORK BETTER AND CUT A GREATER QUANTITY OF KNIT UNDERWEAR, or Fleeced Materials, THAN ANY OTHER CUTTING MACHINE ON THE MARKET

Made in 3 sizes Circular Knives:—Gem, 3 1-4-inch Knife, weight 15 lbs.; Prima, 4-inch Knife, weight 24 lbs.; Giant, 5 1-2-inch Knife, weight 27 lbs. 2 sizes Straight or Reciprocating Knives. Send us sample of material you desire to cut, stating thickness you want to cut at one time, and we will advise you as to which size is best adapted to your wants.



Lindley's New Automatic Power Glove Fingering Machine

SOMETHING ENTIRELY NEW

Will produce two fingers at once.
No weights required to hold work down.
Machine works entirely automatic.
No waste of material.
No skilled help required to run the machine.
Full particulars on application.

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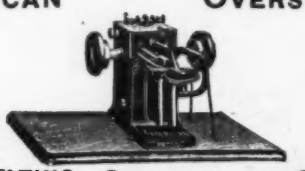

FOR WELTING, OVEREDGING AND SELVAGE EDGES, FOR SWEATERS AND HOSIERY, KNIT GLOVES, ETC. TO SEW IN SLEEVES. NO TRIMMER.

AMERICAN OVERSTITCH MACHINE CO.

18-30 W. RANDOLPH ST. ,CHICAGO, ILL.

NO ROYALTY!

The Industrial Mfg. Co. presents for Outright Sale

The "Industrial" Overseaming Machine

which accomplishes with perfection: (1) The "Industrial" overedge. (2) The "Industrial" overseam. (3) The "Industrial" welt. (4) The "Industrial" concealed stitch.

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We invite correspondence. CAMDEN, N. J.

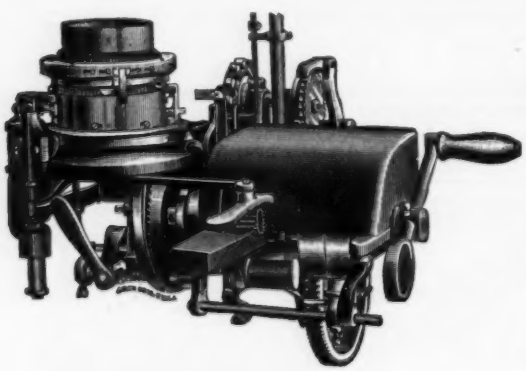
J. CALVIN HESS, Machinery Hall, Bourse Building, PHILADELPHIA, PA.

UNDERWEAR AND SEAMLESS HOSIERY MACHINES.

Full Fashion and Hosiery Machines. Sewing and Finishing Machines.

ESTABLISHED 1866

Largest Permanently Operating Knitting Exhibit in the U.S.A.



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"INCORPORATED."

Our New Knitter is nearly Full Automatic. You knew our old Keystone, it was a good one. This one is just as good. It is a simple durable knitter, having but few parts, and remarkable for its absence of springs, and small features. Capable of a large production and guaranteed to produce good work. Machine without change can be used for transfer work, or ladies' shaped hose.

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SPRING KNITTING NEEDLES

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All Work Guaranteed. MANCHESTER GREEN, CONN.

WM. COREY CO.,

Manufacturers of Knitting Machine

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EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

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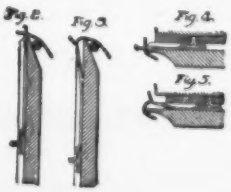
Needles and Supplies for Knitting Mills.

Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.



A NEW AND VALUABLE IMPROVEMENT

On Rib Frame Cylinders and Dial.

Saves Mending and also Breaking of Needles.

For Information Address

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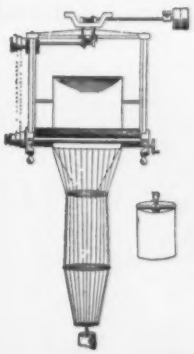

Do not forget if you buy the Improved Patent Dryer you are getting the Best Dryer made, saving fully 3-4 space and doing better work than any known Dryer.

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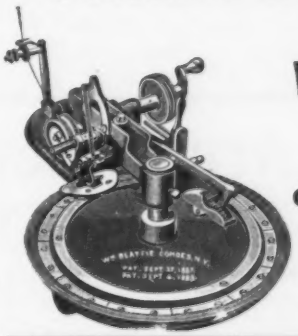

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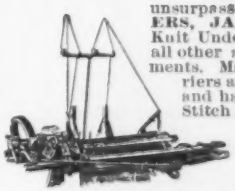
An Illustrated Catalogue will be sent on application.

Our New Improved Light-Running, Short Carriage

KNITTING MACHINE



unsurpassed for full fashioned **SWEATERS, JACKETS, LEGGINS,** regular Knit Underwear, **UNION SUITS,** and all other *regular* and *selvage* Knit Garments. Made with 2 complete yarn carriers and 2-color striping attachment and has the new combined Sweater Stitch Drop Lock and Tubular Lock. Special Glove Machines, Finger-Knitting Machines 3 inches width of needle-bed. **Rapid 2-Thread Lock-stitch Overseamers.**

ARTHUR MUELLER,

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KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

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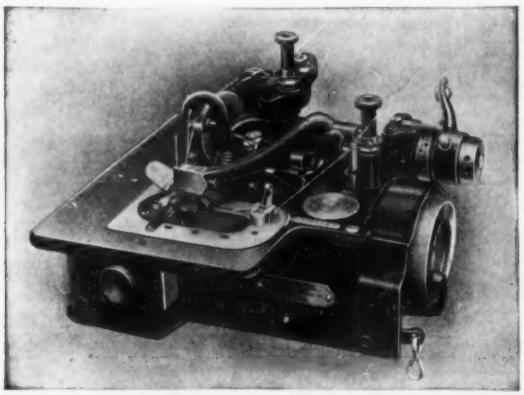
WILLCOX & GIBBS

"OVERLOCK" Machine.

(TRADE MARK.) (Pat. April 5, 1892.)

Patent twice upheld by the U. S. Court of Appeals.



For Trimming, Seaming (or Hemming, or Overedging) and Covering Raw Edges in One Operation of Knit Underwear and Hosiery; and for making Overlock Corded Edge on Woven Fabrics.

WARNING!

Manufacturers and dealers are warned that not only is the "Overlock" Machine fully protected by our four patents of April 5, 1892, and one of May 26, 1896, but the edging products are also protected by patents of March 10, 1896, and Dec. 26, 1899.

WILLCOX & GIBBS SEWING MACHINE CO.,

General Offices:

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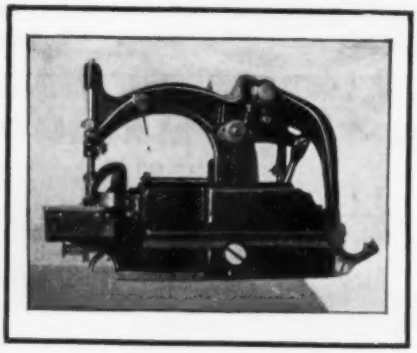
Also, LONDON.—PARIS.—DRESDEN.—MILAN.

The Arnold Sewing Machine Co.

216 High Street, NEWARK, New Jersey.



Overedge Welting Machine, *with Trimmer.*

The very best in the market. (No royalty.)

Overedge Seaming Machine, *with Trimmer.*

3000 stitches per minute. (No royalty.)

Overedge Sewing Machine, *without Trimmer.*

For manufacturers of knit goods and other fabrics, with or without trimmers.

Our claims are Simplicity, Durability, Accessibility,

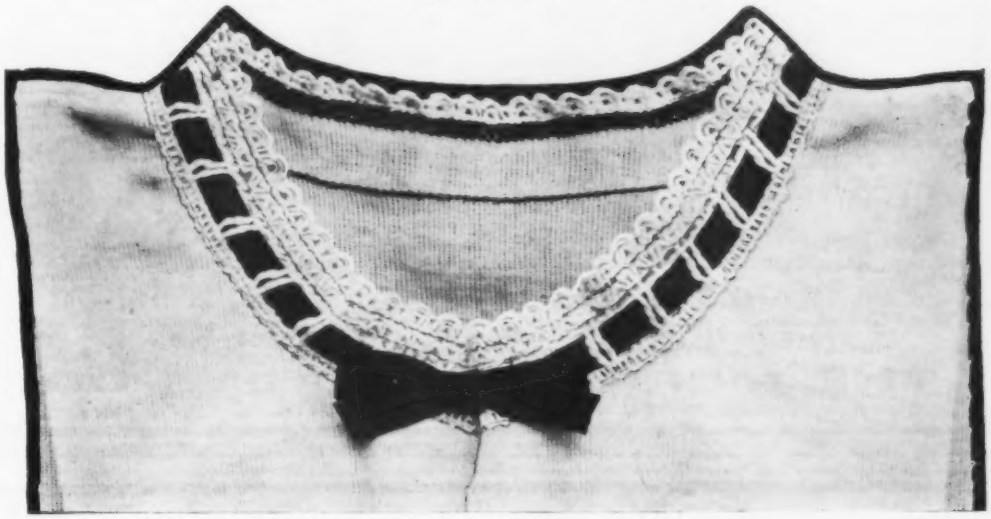
EVERY PART OF OUR MACHINE BEING READILY ACCESSIBLE.

This machine has 100 less parts than any other overedge machine.

Do you use this Collarette Finish?

Union Special Machine Style 12700

Stitches lace on opposite sides of ribbon and covers raw edge of web in one operation.



This is the only machine that will stitch the lace to the garment and position the cross bars of the lace. If you are not satisfied with your present methods and want to reduce cost, and at same time improve quality, write us for samples and information.

Union Special Sewing Machine Co.

CHICAGO. NEW YORK. PHILADELPHIA. BOSTON. AMSTERDAM, N. Y. COHOES, N. Y. ST. LOUIS. CINCINNATI.

WILFRED WELLS,

Sole Manufacturer of the

CHAMPION HOSIERY STAMP.

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The Only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics. BLOCKS FOR PRINTING HOSIERY.

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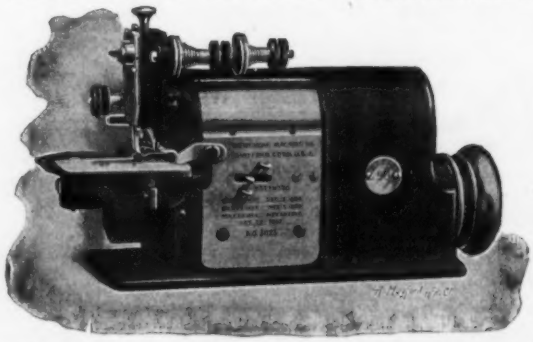
IF you have any problem in connection with lubrication which you cannot solve to your own satisfaction, we are willing to put our time against yours to prove that Dixon's Flake Graphite is the solution. Ask for booklet 120-c.

JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J.

THE CHEAPEST and BEST METHOD
OF
FINISHING RIBBED KNIT GOODS
IS BY THE USE OF
OUR HIGH SPEED MACHINES.



BLANKETS, SKIRTS or COTTON GOODS,
requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.
Send for Catalogue and Samples, stating the kind of goods to be finished.

THE MERROW MACHINE CO.,
346 Broadway, New York. HARTFORD, CONN. Bourse Bldg., Phila.

The American Knitting Industry in 1903

¶ The American Directory of the Knitting Trade in the United States, Canada and Mexico for 1903 has just been published and will be sent to any address on receipt of the Price, $2.00. *Contains a List of the New Mills—corrected up to date.* Has flexible covers so that it may be carried comfortably in the pocket. *Is of incalculable value to manufacturers of Machinery or Supplies catering to the Knitting Trade.* .. .. ..

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MAKE YOUR OWN PAPER BOXES!

SAMUEL M. LANGSTON,

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Paper Box Machinery.

Supplies Complete Outfits for Knit Goods Manufacturers.

501 LOCUST STREET,

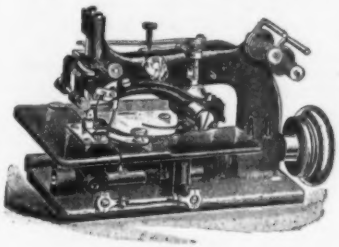
PHILADELPHIA, PA.

Correspondence Solicited.

—THE—

Champion Rib Knitting Machines

For HOSIERY AND UNDERWEAR



Also Sewing and Trimming Machines, Crochet and Shell Machines, and all other Machinery required in the finishing of Hosiery and Underwear. Complete Plants Installed.

Estimates Cheerfully Given.

Our New Overseaming Machine.

CHAMPION MACHINE CO.,

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PHILADELPHIA.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

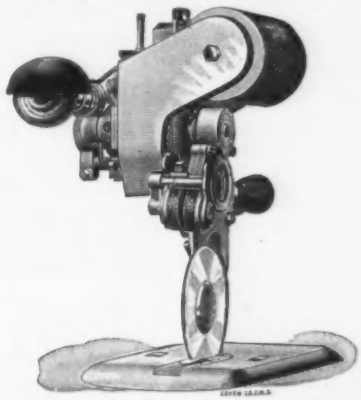
EFFICIENT
DURABLE
LOW IN PRICE

The "STAR" CUTTER

Shown below is especially adapted

For Knitting Mills.

Cuts Any Shape and Many Thicknesses of Fabrics.



Has ball bearings; requires but 1-6 horse power; uses direct current; patent flexible take-up device. Acceptable to insurance underwriters. Repairs almost nothing. Now in use by a number of first-class knitting mills, to whom reference can be made.

WOLF ELECTRICAL PROMOTING CO.,

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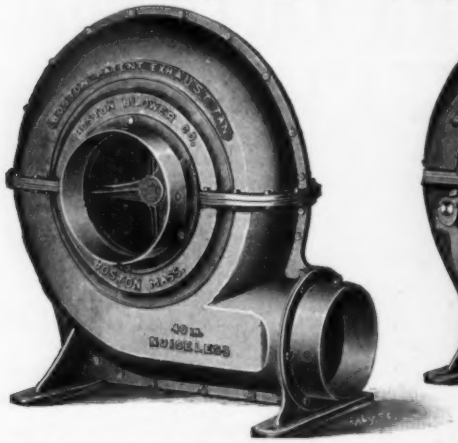
Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



Inlet Side of Right-hand Wool Exhauster.

Pulley Side of Left-hand Wool Exhauster.

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removab e.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**

WATER WHEELS

FOR ALL HEADS FROM 3 FEET TO 2000 FEET.

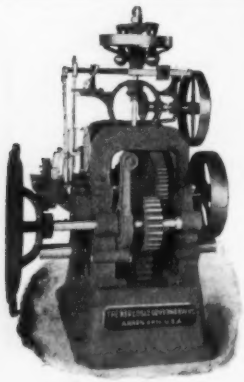
Adapted to all **POWER** Purposes. Easy working balanced gates. We guarantee greatest power with smallest quantity of water, at both full and part gates.

State Head and Power Required.

AUTOMATIC ENGINES

10 to **50** H.P., guaranteeing best possible regulation with highest economy in steam. Pamphlet of either Wheel or Engine sent on application.

JAMES LEFFEL & CO., Springfield, Ohio, U. S. A.



WATERWHEEL GOVERNORS

FOR TEXTILE MILLS

Electric Light, Power and Railroad Work

We are now prepared to **guarantee absolute satisfaction.** Write for references in your locatity.

THE REPLOGLE GOVERNOR WORKS

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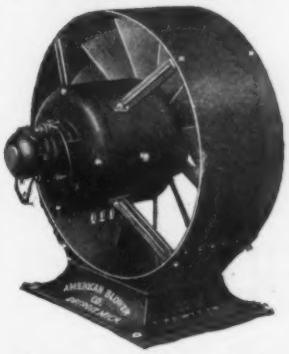
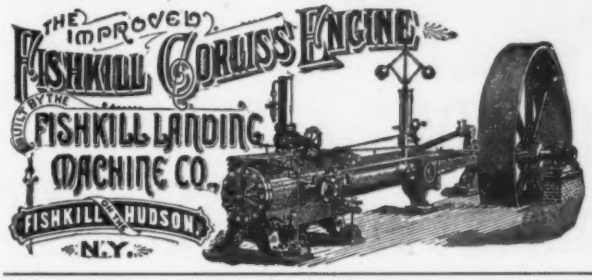


The
"A B C" Disc
Ventilating Fan

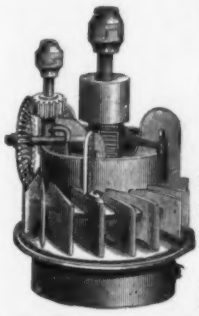
is the most effective means of cooling and ventilating over-heated apartments. Furnished with pulley, direct-connected engine or motor. Send for Catalogue No. 140 G.

American Blower Company Detroit MICH.
NEW YORK CHICAGO LONDON



UNRIVALED AS THE MOST
Efficient, Durable and Economical power extant.

For Close Regulation and Noiseless Operation it has NO EQUAL.



TURBINES ON HORIZONTAL AND VERTICAL SHAFTS.

These wheels are specially designed and adapted to TEXTILE MILLS

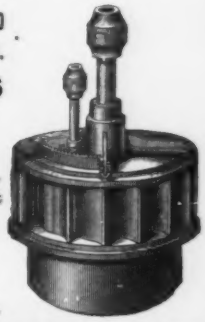
The records of the Risdon Wheel are not equaled by the records of any other wheel. Average of results of tests in Holyoke Flume: Full Gate, .8694; Seven-eight, .8472; Three-quarter, .8014; Five-eighth, .7601.

RISDON CELEBRTAED TURBINES. ALCOTT HIGH DUTY TURBINE. Unequalled Efficiency. Easy Working Gate. Greatest Power from a Limited Quantity of Water at Smallest Cost.

TAYLOR SLEEVE GATE TURBINE. The largest power ever obtained from a Wheel of the same diameter.

SEND FOR CATALOGUE.

RISDON-ALCOTT TURBINE CO. Mount Holly, New Jersey, U.S.A.

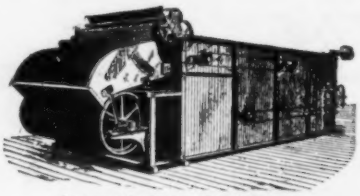


Davidson Fans are so built that the cost of installation is practically nothing—the cost of keeping in repair is still less. WHY is fully described in our catalogue 50a which is yours for the asking.

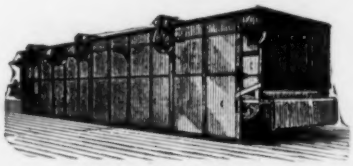
MASSACHUSETTS FAN CO.,
Waltham, Mass.

THE DAVIDSON FAN WHEEL.

JUN 16 1903



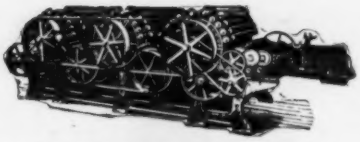
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

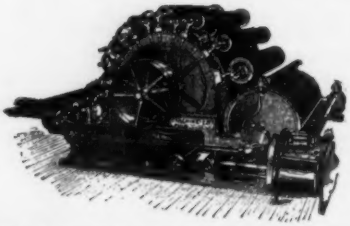
"CYCLONE" DRYERS

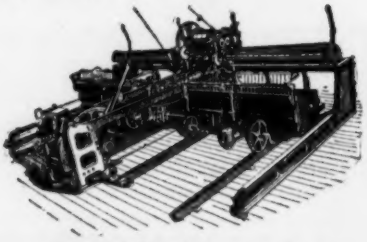
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

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Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

Estimates, drawings and full particulars of complete plants furnished on application

SEE INSIDE FRONT COVER PAGE

JAMES SMITH WOOLEN MACHINERY CO.

411 to 421 Race Street, Philadelphia.

Woolen Machinery

FOR

Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.

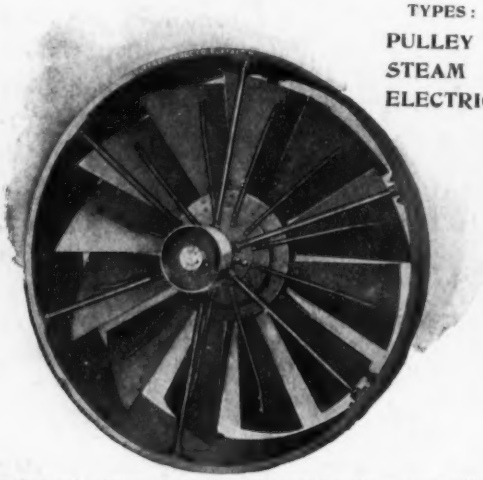
Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 59.

BUFFALO DISK WHEELS

For Cooling, Ventilating, Drying

TYPES:
PULLEY
STEAM
ELECTRIC

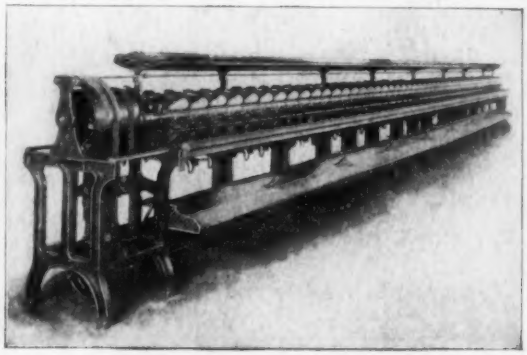


For Removing Steam from Slashers and Dye-Houses as well as all offensive odors common to dying processes. They are largely and successfully employed in cotton-linen and woolen mills for such purposes as well as for preventing harmful condensation of steam in the room.

BUFFALO FORGE COMPANY, Buffalo, N. Y.

The New Foster Cone Winder

for Cotton, Silk and Worsted.



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